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WAGE ROUNDS, 1948-1959

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‘Men wiser and more learned than I have discerned in history a plot, a rhythm, a predetermined pattern. These harmonies are concealed from me. I can only see one emergency following upon another as wave follows upon wave. . . .’—H. A. L. Fisher, *A History of Europe* (1934), Vol. I, preface.

‘This does not mean that the scientific observer ought to start with a mind free from preconceived ideas as to classification and sequences. If such a person existed, he would be able to make no observations at all. . . . Almost any preconceived ideas as to the connection between phenomena will help the observer . . .’—S. and B. Webb, *Industrial Democracy* (1919), preface.

‘. . . one reason why the very considerable speculative ability of English economists has so often the appearance of beating the air, *bombinans in vacuo*, is that it has not had furnished to it sufficiently concrete statements of actual groups of circumstances.’—W. J. Ashley, *The Adjustment of Wages* (1903), introduction.

Many views have been put forward since the war concerning the nature of the so-called ‘wage round’; nor have the pronouncements been confined to economists. The main suggestions offered have been as follows:

- (1) Wage negotiations are increasingly interdependent: ‘union leaders in a number of key industries have had informal consultations to seek some loose understanding and cohesion about their negotiations’¹; ‘the conduct of wage claims is nowadays as rigidly stylised as the classical ballet.’²
- (2) Market forces affecting particular industries are irrelevant; the wage round is virtually irresistible. ‘The wage claims which have been submitted over the whole field of industry have conformed to a certain pattern irrespective of the profitability of individual industries or of their productivity’³; ‘we think . . . that we are justified in pointing

¹ *Sunday Times*, September 20th, 1959.

² *Financial Times*, December 4th, 1959.

³ *Report of a Court of Inquiry* into a dispute between engineering employers and unions, Cmd. 159, May, 1957, para. 55.

out that if any group of employers offers stubborn resistance to a wage claim which is part of a series of similar claims affecting the entire economy the result is likely to be that friction is generated and industrial relations seriously strained'.¹

- (3) The wage round is an annual event, and appears to affect all wage earners: 'it may seem a little premature to be looking forward to next year's wage negotiations at a time when this year's wage round is less than half completed'²; 'if this sort of figure is . . . the typical result of the negotiations (covering more than half of all wage earners) which are still to come, the year as a whole will have been marked by a definite reduction in the scale of wage increases'.³
- (4) A typical money or percentage increase characterises a particular annual round, and the 'pattern' is determined institutionally: ' . . . there has been a growing tendency in recent years for a particular level of increases to be regarded as constituting a 'pattern' for that year. The establishment of such patterns is to some extent the consequence of the way in which arbitration and other statutory wage-fixing bodies have operated but is also due to the widespread view that what have become almost traditional relationships between wage rates in different industries should be maintained even in cases where there is no direct connection between the industries concerned and little interchangeability . . . in the classes of labour which they respectively employ'.⁴
- (5) A 'chain reaction' is set off by one or more 'key' bargains. in distinguishing between 'barometric' and 'coercive' pressures on wages, Bowen⁵ cites the post-war experience of Britain and Sweden as 'especially clear and impressive examples of the chain reaction which can be set off by an increase in the wages of certain workers, and the strength of the tendency for coercive comparisons to cause an upward spiral of the entire wage structure'; Flanders⁶ considers that 'the main wage movements are strategically determined; they spread out from a relatively small number of key bargains'. Again (to quote Routh), 'as those solar systems [large industrial groups] go shuffling through space . . . they preserve the essentials of their configuration . . . one part cannot move without giving a tug to the others.'⁷

¹ *Ibid.*, para. 57.

² *Cohen Council*, Second Report, August 1958, p. 30.

³ *Ibid.*, p. 29.

⁴ British Employers' Confederation, *Report to Conference on Industrial Relations*, October 16th-17th, 1958.

⁵ William G. Bowen, *The Wage-Price Issue*, Princeton, 1960, pp. 137 f., 214 f.

⁶ Allan Flanders in Flanders and Clegg, *The System of Industrial Relations in Great Britain*, 1954, p. 319.

⁷ Guy Routh, 'The Structure of Collective Bargaining,' *Political Quarterly*, January-March, 1956, p. 50.

- (6) Various industries are cited as regular leaders and/or 'pace setters'. 'In almost every year since 1950, the weak link in any stand by employers over wages has been a nationalised industry, notably the railways'.¹ 'Since the war negotiations in engineering have tended to set the pattern for the larger part of the labour market'²; in 1959 an attempt was made 'to try to ensure that the pattern of wage settlements . . . would be set by the engineers and electrical workers, rather than by the normal pace setters like the miners, railwaymen, and busmen'.³ Electricity supply workers,⁴ distributive workers,⁵ and others are also cited.
- (7) The wage round does not stop at national frontiers: 'the movement towards a shorter working week looks like being the main development in collective bargaining in industry this winter. . . . In fact a reduction in hours appears to be part of a general pattern in many countries. Mr. Khrushchev has promised the Russian workers a 35-hour week. The Common Market Treaty commits the Six to a 40-hour week by the end of the transitional period'.⁶

The current emphasis on a quasi-automatic progression is fully in line with the swing away from 'purely economic' theories of wage determination; but, while a belief in the existence of wage rounds is by now a matter of dogma, the nature of these rounds still remains something of a mystery. The object of this article is primarily to clarify some of the implied concepts, and to see how far these appear to have been justified by events.⁷

All concepts of the wage round imply some sort of repetitive pattern: the three most important should be distinguished as follows:

(1) *Grouping of settlements in time.* In this case the only pattern consists in a chronological bunching of settlements involving wage increases. There need be no similarity in the amounts of the increases; nor need there be any special significance in the particular industries which are affected.

(2) *Similarity of increases.* Here it is only the actual amounts (whether in money or percentage terms) which are recognisably associated. There need be no marked bunching in time; and the particular industries affected are again irrelevant.

¹ *Economist*, July 2nd, 1960.

² *Sunday Times*, September 20th, 1959.

³ *Financial Times*, September 21st, 1959.

⁴ *Ibid.*

⁵ *Financial Times*, April 25th, 1960.

⁶ *Financial Times*, November 20th, 1959.

⁷ The wages in question are, of course, nationally negotiated rates: only wage rates change discontinuously enough for such progressions to be observable. While the movement of actual earnings is clearly related to that of wage rates (although the levels of earnings and rates may, over time, have diverged very greatly), this movement is more or less continuous: earnings vary not only from worker to worker and from firm to firm but also, for individuals, often from week to week.

(3) *Inclusiveness*. In this case, a wage round is distinguished by the fact that most or all of the industries considered secure wage increases (though not necessarily in the same order) on successive occasions. Similarity of increases, though it may occur, is not relevant; nor need there be any particular bunching in time.

There seems to be a subconscious recognition of these three concepts in most current pronouncements, though it is seldom clear which of them (singly or in combination) is being considered. Part of the trouble is that there is no readily available source of the information required which is presented in a systematic and manageable form.

Sources

What is needed, ideally, is a record of the actual money increase obtained in each case; of the industries, industry or part of industry covered by the particular agreement; of the number of people involved; and of the date of announcement of the increase. For a thorough study, details of original claims and subsequent discussions would be desirable. There is no single published source for this material, the potential sources being the Ministry of Labour, the Press and the Labour Research Department. These sources are subject to the following limitations:

(1) *Ministry of Labour*. The *Gazette* publishes, monthly:

(a) A summary table giving the 'approximate number of workpeople affected by net increases' and the 'estimated net amount of increase in weekly rates of wages'. This looks like a possible source for the numbers involved; but the industry grouping used follows the Standard Industrial Classification ordering, and therefore relates to very broad sections of industry which generally obscure the actual negotiating groups concerned. Moreover, the source could in any case be used for this purpose only so long as the group of workers in question had received only one increase to date (*i.e.*, in the course of the months considered).¹

(b) A list of 'Principal Changes in Rates of Wages'. This material is extremely detailed, but its very minuteness renders any attempt to make a wholesale use of it too time-consuming to be practicable. A further drawback is that the date given is that 'from which the change took effect', whereas from the point of view of the wage round the

¹ The monthly totals are presented cumulatively and relate to all the months of the year in question preceding that in which the table is published. In the presentation of the 'approximate number of workpeople affected by net increases', no worker figures more than once in the period concerned: 'workpeople who receive two or more increases of wages during the period are counted only once in this column'. The figures are necessarily approximate: the Ministry makes the best estimate it can of the numbers affected by each change reported to it, but in some cases little or no reliable information is available. The 'estimated net amount of increase' for an industry group is a product of the above estimates of numbers affected within the group and a further estimate of the average wage increase for the workers in question.

important date is presumably that of the announcement of the increase (or, in the case of Wages Council Orders, the date of the 'proposal').¹

The Ministry's unpublished material includes:

- (c) Its collection of agreements, which are filed, together with related material, under industry headings. This is of course a potential source, although also a most uneconomic one if any other is available.
- (d) The raw material for the overall index of wage rates. These data, again, suffer from the drawback—for the present purpose—of relating to the 'industries' and 'orders' of the Standard Industrial Classification.²
- (2) *The Press*. Most important wage negotiations are reported in the national newspapers, but the coverage is inclined to be haphazard. Some newspapers keep comprehensive files of news cuttings of wage topics, but these are apt to be too general in their scope to be a convenient source.
- (3) *The Labour Research Department*. A summary of current wage negotiations is provided in the 'Industrial Notes' of the monthly publication *Labour Research*. This material is presented in something like an appropriate form: each negotiating group is mentioned separately, together with the specific money increases as these are settled. The range of these notes is far from being exhaustive (they probably include less than 10 per cent of the settlements reported to the Ministry of Labour); but, even so, reference is made to some 130 negotiating groups and the total of settlements noted over the twelve-year period 1948-59 amounts to no less than 530. Details also are given of the presentation and subsequent modification of claims, although not systematically enough to be worth analysing without collateral evidence. But the wage negotiations of all the big industries, and of many smaller ones, are documented fully enough to enable one to gain a first impression of the general patterns of wage change.

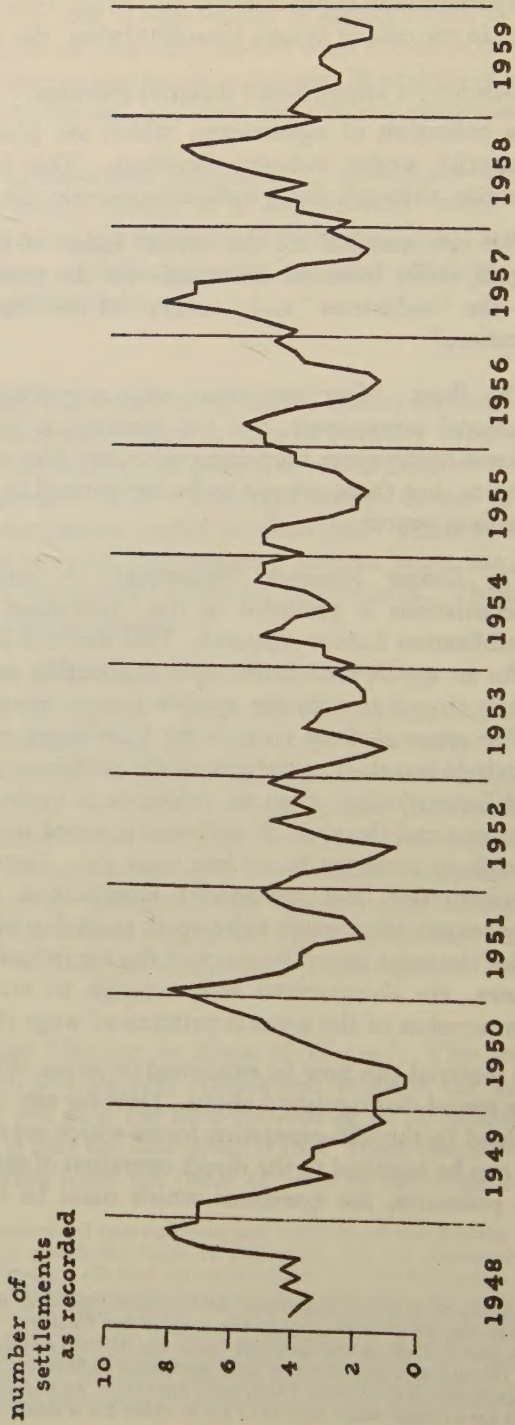
This material can now be examined in terms of the three main aspects of the wage round distinguished above. How far any observed patterns have to be explained by the self-generating forces which are often postulated, and how far they can be ascribed to the direct operation of more general economic and political pressures, are questions which must be reserved to a concluding section.

¹ The dates of selected important settlements, together with brief summaries of their main provisions, are now to appear annually in the *Gazette*.

² For a description of the methods used, see *Ministry of Labour Gazette*, February 1957. Professor Devons and others have also calculated indices for S.I.C. orders, to publish them in the *Manchester School* (May 1958) and, currently, in the *Guardian*. But in any case the concept of an average wage rate is of little value for a study of wage rounds.

I: Incidence of Main Wage Settlements, 1948-59

(three-month moving average)



(1) *Grouping of settlements in time*

It should first be asked whether there is any noticeable pattern in the mere incidence of wage agreements, irrespective of numbers affected. Diagram I shows the numbers of negotiated wage increases occurring in each month from January 1948 to December 1959 (including with these the shorter-hours agreements of the latter part of the period), as recorded in *Labour Research*. It seemed preferable to plot 3-month moving averages rather than the crude monthly totals, both because in some cases the precise dating of the agreements in question was not clear (though no error is likely to have exceeded one month) and because this method tends to smooth out minor variations in the general pattern. It is perhaps a little surprising that the fluctuations, at any rate at the beginning and end of the period, should be so strongly marked, and also (in view of the seasonal concentration of trade union conferences, which are often the starting point of wage claims) that they should appear to be independent of seasonal influences.¹

In terms of timing alone, there were definite wage rounds from August 1948 to March 1950, from March 1950 to July 1951, from July 1951 to May 1952, from August 1955 to August 1956, from August 1956 to October 1957, and from October 1957 to September 1959. The period from May 1952 to August 1955 is harder to interpret; but since the rounds were of shorter duration, this may partly explain why they are less well marked. Tentatively one may say that the dating is as follows: May 1952 to April 1953, April 1953 to September 1953, September 1953 to July 1954, and July 1954 to August 1955.

If, on this evidence alone, one looks for signs of 'leadership', one naturally concentrates on the periods during and immediately after the troughs in Diagram I. Certain groups tended to conclude agreements at these times: transport workers, notably in road haulage, road passenger transport, and the railways; and distributive workers, notably in retail co-operatives and multiple groceries. But to initiate (*i.e.*, to be the first in time) is not necessarily to instigate (*i.e.*, to command a large following): it might be thought unlikely that so small a section as, for example, road haulage workers would 'set the pattern' of a wage round—even though they do belong to a very large and powerful trade union. It may well be considered that initiation is not really the point, and that instigation is what matters. But here the evidence can only confirm (or fail to confirm) existing preconceptions; it cannot generate them. One has to judge on quite other grounds (*e.g.*, on a detailed knowledge of the concomitant circumstances of particular bargains—or of the current practice of particular unions—and not simply of the timing of the bargains) which settlements are 'important'. Thus one can say *a priori* that engineering settlements are important because they have been followed (or accompanied) by settlements in shipbuilding, and have generally seemed to lead those concluded—also in many cases by members of the Confederation of Shipbuilding and Engineering Unions—for Government industrial establishments,

¹ Claims, however, may well be found to be seasonal in their incidence.

civil air transport, motor retailers and repairers and other groups; and electricity supply and gas have also tended to run together. But do such groupings add up to the motive power of a wage round in the popular sense? While the 'important' settlements in this sense usually account for the peaks in Diagram I, there is little to show that the influence of any of them extends beyond its acknowledged dependants: if it did, one would expect each 'round' to be skewed to the left in the diagram. In several cases the 'important' agreements coincide in time or are closely grouped; but they do not always occur in the same order, and their possible interconnection is not deducible from data of this kind.

(2) *Similarity of increases*

Is there in fact any pattern in runs of similar money or percentage amounts, *i.e.*, in groups of settlements each resulting in increases of (say) between 7s. and 8s. a week, or of (say) between 4 and 5 per cent on the previous rates? To answer this, we have to look at the recorded increases (a) in money terms and (b) in percentage terms; and while the former is relatively simple, the latter presents enquirers with the sometimes formidable difficulty of ascertaining the precise rates in question prior to the granting of the increases.

(a) *Increases in money terms*

A problem arises in tabulating the money increases specified in the records, since some settlements provide for uniform flat-rate increases to all grades covered while others provide for a whole range of differential increases. Although these two types of settlement are different both in intention and in effect, they are clearly part of one universe: *e.g.*, a 7s. 4d. flat-rate increase should not be taken as wholly independent of a 7s. 4d. increase which related only, say, to skilled workers. In Diagram II (p. 8) and Table I (p. 10), this Gordian knot has been cut by the adoption of the following procedure: each flat-rate increase recorded is counted as a single 'occurrence' and, where the increases are recorded as differentiated, the upper and lower limits alone are so counted.

Diagram II shows the duration of 'runs' of similar money increases, expressed in terms of shillings per week, between 1948 and 1959—the increases being grouped in 1s. class intervals. A 'run' is understood as a period during which a number of similar increases occurred, there never being a gap of more than two successive months between such increases. In order to give some idea of the concentration of occurrences, the total of these is set above the line representing each run, together with a breakdown of the occurrences according to their types. Table I summarises this information.

It may be objected that Diagram II and Table I represent no more than a distribution of wage increases over a twelve-year period; and one clearly has to go further before establishing the existence of genuine runs of increases. If, for instance, a 'run' as defined above turned out on inspection to consist

TABLE I
 'Runs' ¹ of Wage Increases of Similar Money Amounts, 1948-1959

Range shillings per week) ² (1)	Dates ³ (2)	Length (months) (3)	Total occur- rences in 'run' (4)	Average occur- rences per month (5)	Type of occurrence ⁴ (breakdown of col. 4)		
					flat rate (6)	upper limit (7)	lower limit (8)
3s. to 3s. 11½d.	9/48- 3/49	8	12	1.5	8	1	3
	1/54-10/54	10	7	0.7	4	0	3
4s. to 4s. 11½d.	10/48-10/49	13	15	1.2	12	0	3
5s. to 5s. 11½d.	2/48- 7/49	18	30	1.7	24	5	1
	6/50- 2/51	9	13	1.4	9	1	3
	5/52- 4/55	34	20	0.6	16	1	3
	3/58- 6/59	16	13	0.8	6	2	5
6s. to 6/11½d.	1/48- 8/48	8	6	0.8	5	0	1
	7/50-12/50	6	6	1.0	2	1	3
	6/58- 1/59	8	12	1.5	6	2	4
	6/59-11/59	6	6	1.0	6	0	0
7s. to 7s. 11½d.	1/48- 7/48	7	10	1.4	8	0	2
	10/50- 5/56 ⁵	68	65	1.0	45	8	12
	12/56- 5/57	6	10	1.7	8	0	2
	11/57- 8/59	22	29	1.3	20	7	2
8s. to 8s. 11½d.	12/53- 6/54	7	5	1.4	2	2	1
	10/55-12/55	3	5	1.7	1	0	4
	4/57- 7/57	4	5	1.3	4	0	1
9s. to 9s. 11½d.	1/51- 6/51	6	6	1.0	4	1	1
	11/55- 5/56	7	8	1.1	3	0	5
	3/57- 8/57	6	13	2.2	10	1	2
	4/58- 2/59	11	6	0.5	4	1	1
10s. to 10s. 11½d.	9/54- 9/56	25	18	0.7	8	8	2
11s. to 11s. 11½d.	11/50- 7/51	9	9	1.0	5	3	1
	11/51- 2/52	4	5	1.3	4	0	1
	1/55- 7/55	7	8	1.1	4	4	0
	12/55- 4/56	5	6	1.2	1	4	1
	4/57-10/57	7	6	0.9	4	2	0

¹ 'Runs' may sometimes include gaps—but never of more than two months—in which no increase in the range in question was recorded.

² These ranges include settlements made in the form of pence per hour, converted to the appropriate weekly rate. Settlements involving a shortening of hours of work, although often associated with 'compensatory increases' in rates of pay, cannot be expressed in terms of simple wage increases and are therefore omitted (this omission only really affects the second half of 1959).

³ The dates given are those of the first and last months of the 'run' in which increases of the size in question were recorded.

⁴ A wage settlement provides either for a flat-rate increase to all categories of workers in an industry, or for differential increases to a number of grades. In this table, 'flat rate' is self-explanatory; 'upper limit' indicates the size of the biggest of the differential increases specified, and 'lower limit' that of the smallest. Thus one settlement may appear more than once in col. 4 if the upper and lower limits occur in simultaneous 'runs' of different money amounts.

⁵ This protracted run falls into four main 'sub-runs', separated by appreciable gaps in which only isolated settlements were recorded. These sub-runs were as follows (columns numbered as above):

Continued on p. 11.

of two flat-rate, two 'upper-limit' and two 'lower-limit' increases, the actual amounts varying irregularly from, say, 6s. to 6s. 11d. a week, it might be doubted whether this was of any particular significance. On the other hand, six occurrences of the same type and of precisely the same money amount could hardly appear accidental. Regarding therefore as significant only those runs in which there were marked identities in money amounts, we have excluded three of the thirty-one¹ runs indicated in Table I, details of the remaining twenty-eight being given in Table II (p. 90). Before the question of 'leadership' is examined, the data may be similarly analysed in percentage terms.

(b) Increases in percentage terms

These are shown in Diagram III (p. 14) and Table III (p. 15).² An analogous convention has been adopted to cover settlements providing for equal-percentage increases and those providing for differential-percentage increases: obviously, what appeared in Diagram II as a single flat-rate money increase to differently-paid grades will appear in Diagram III as two separate 'occurrences' of differentiated-percentage increases (always supposing that both of these featured in perceptible percentage runs). The definition of 'runs' is as before: *i.e.*, a run is understood as a period during which a number of similar increases occurred, there never being a gap of more than two successive months between such increases.

Perhaps the most striking feature of the two diagrams is their general similarity to each other. For if, as has often been suggested or implied, those who settle wages tend to think exclusively *either* in money terms *or* in percentage terms, we should expect the patterns to be dissimilar in one of two ways:

- (a) If people 'thought in percentages', one would expect relatively few flat-rate increases in Diagram II coupled with relatively many 'equal-percentage' increases in Diagram III (or *vice versa*, if they thought in terms of flat-rate increases).
- (b) If, further, people thought in terms of a particular percentage increase, one would expect a marked concentration in the appropriate class

¹ Counting the single run from 10/50 to 5/56 as four separate runs, as indicated in note 5 to Table I.

² The number of percentage increases examined was slightly smaller than the number of money increases. This was due to the difficulty, mentioned above, in establishing the appropriate original rates in some cases. (However, a rather larger number of percentage increases than of money increases came into perceptible 'runs'—partly because 1 per cent class intervals are somewhat more inclusive than 1s. class intervals, at present wage levels.)

Notes continued from Table I.

(7)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
7s. to 7s. 11½d.	10/50- 4/51	7	14	2.0	7	4	3
	12/51- 2/53	15	21	1.4	18	1	2
	1/54-12/54	12	13	1.1	8	2	3
	3/55-10/55	8	8	1.0	3	0	5

This breakdown shows that the detailed characteristics of this exceptionally long run do in fact generally conform with those of the other runs that were going on concurrently.

TABLE II
Instances of Specific Money Amounts in Wage 'Runs', 1948-1959

Dates from Table I)	Precise amount (shillings per week)	Number of instances			Total occurrences (from Table I)
		flat rate	upper limit	lower limit	
9/48- 3/49	s. d. 3 8	8	0	2	10
1/54-10/54	3 0	3	0	2	5
10/48-10/49	4 0	9	0	2	11
2/48- 7/49	5 0 5 6	5 19	3 2	1 0	30
6/50- 2/51	5 0 5 6	5 6	0 0	2 0	13
5/52- 4/55	5 0 5 6	7 9	0 0	0 2	18
3/58- 6/59	5 0 5 6	2 4	0 2	2 2	12
1/48- 8/48	6 0	4	0	0	4
7/50-12/50	6 0	2	1	0	3
6/59-11/59	6 0	6	0	0	6
1/48- 7/48	7 4 7 6	3 5	0 0	0 1	9
10/50- 4/51	7 0 7 4 7 6	1 4 1	1 0 3	2 0 1	13
12/51- 2/53	7 0 7 4 7 6	4 10 3	0 1 0	0 1 1	20
					21

1/54-12/54	...	...	...	7	0	3	1	1	13	13
				7	4	4	1	0		
				7	6	1	0	2		
3/55-10/55	...	...	...	7	0	0	0	3	8	8
				7	4	3	0	2		
12/56-5/57	...	...	...	7	0	1	0	0	10	10
				7	4	2	0	2		
				7	6	5	0	0		
11/57-8/59	...	...	...	7	0	8	0	1	29	29
				7	4	7	5	1		
				7	6	5	1	1		
10/55-12/55	...	...	...	8	3	0	0	3	3	5
1/51-6/51	...	...	...	9	2	3	0	0	3	6
11/55-5/56	...	...	...	9	0	2	0	2	6	8
				9	2	1	0	1		
3/57-8/57	...	...	...	9	0	3	0	1	12	13
				9	2	6	1	1		
4/58-2/59	...	...	...	9	2	4	1	0	5	6
9/54-9/56	...	...	...	10	0	8	6	2	16	18
11/50-7/51	...	...	...	11	0	2	2	1	5	9
11/51-2/52	...	...	...	11	0	3	0	0	3	5
1/55-7/55	...	...	...	11	0	3	3	0	6	8
12/55-4/56	...	...	...	11	0	1	3	1	5	6
4/57-10/57	...	...	...	11	0	3	2	1	6	6

Note.—The difference between the total of 'instances' and the 'total occurrences (from Table I)' is accounted for by usually isolated instances of money amounts which, although falling within the original class intervals of Table I, differed from the specific amounts listed in this table and have therefore been omitted.

III: "Runs" of Similar Percentages, 1948-59

E = equal percentage
 U = upper limit
 L = lower limit

cf. Table I, note 4

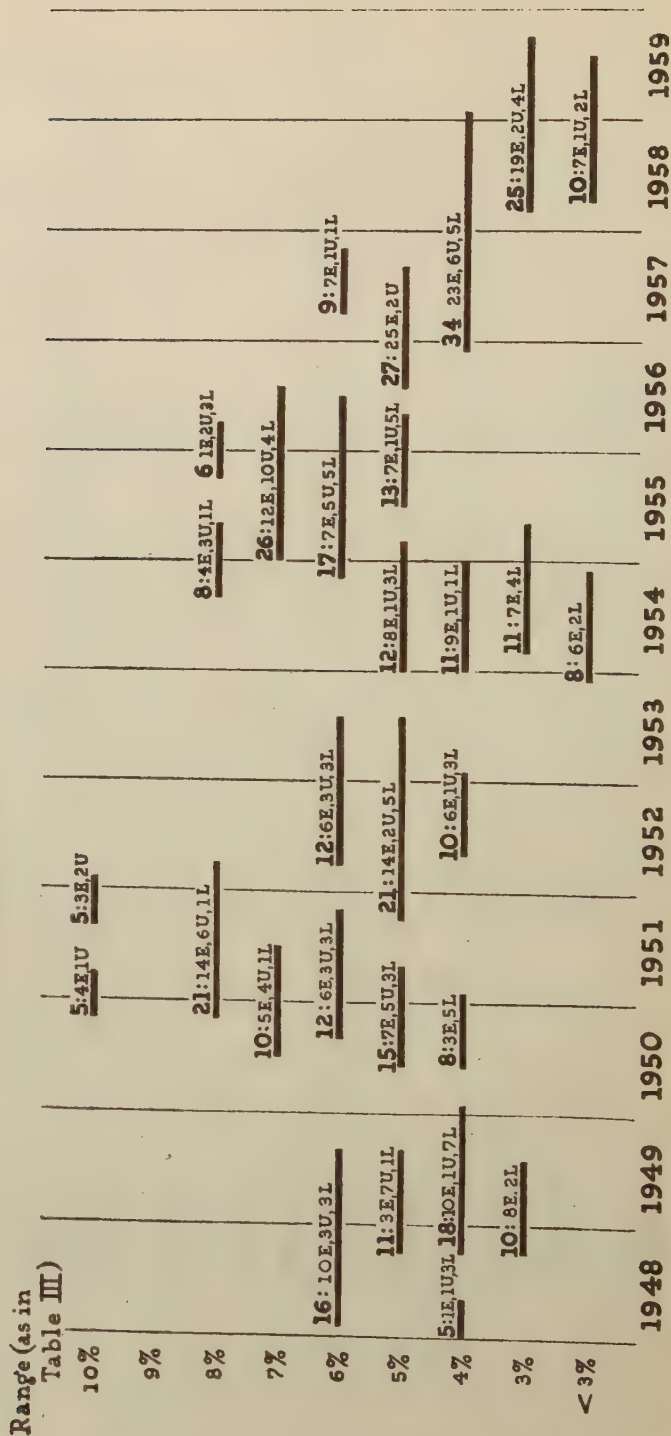


TABLE III

'Runs' of Wage Increases of Similar Percentages, 1948-1959¹

Percentage range ² (1)	Dates (2)	Length of 'run' (months) (3)	Total occurrences in 'run' (4)	Average occurrences per month (5)	Type of occurrence (breakdown of col. 4)		
					equal percentage (6)	upper limit (7)	lower limit (8)
under 3 per cent	12/53-11/54	12	8	0.7	6	0	2
	4/58- 7/59	17	10	0.6	7	1	2
3 per cent	10/48- 7/49	10	10	1.0	8	0	2
	3/54- 4/55	14	11	0.8	7	0	4
	3/58- 9/59	19	25	1.3	19	2	4
4 per cent	1/48- 4/48	4	5	1.2	1	1	3
	10/48- 1/50	16	18	1.1	10	1	7
	6/50- 1/51	8	8	1.0	3	0	5
	5/52- 1/53	9	10	1.1	6	1	3
	1/54-12/54	12	11	0.9	9	1	1
	12/56- 1/59	26	34	1.3	23	6	5
5 per cent	10/48- 8/49	11	11	1.0	3	7	1
	6/50- 4/51	11	15	1.4	7	5	3
	10/51- 7/53	22	21	1.0	14	2	5
	1/54- 2/55	14	12	0.9	8	1	3
	7/55- 4/56	10	13	1.3	7	1	5
	8/56- 8/57	13	27	2.1	25	2	0
6 per cent	2/48- 8/49	19	16	0.8	10	3	3
	9/50-10/51	14	12	0.9	6	3	3
	4/52- 1/53	10	12	1.2	6	3	3
	11/54- 6/56	20	17	0.9	7	5	5
	4/57-10/57	7	9	1.3	7	1	1
7 per cent	7/50- 6/51	12	10	0.8	5	4	1
	1/55- 7/56	19	26	1.4	12	10	4
8 per cent	11/50- 3/52	16	21	1.3	14	6	1
	9/54- 4/55	8	8	1.0	4	3	1
	10/55- 3/56	6	6	1.0	1	2	3
10 per cent	11/50- 3/51	5	5	1.0	4	1	0
	9/51- 1/52	5	5	1.0	3	2	0

¹ Definitions as in Tables I and II.² The '3 per cent range' includes increases from 3.00 to 3.99 per cent; and so on.

interval in Diagram III to be offset—probably—by a wide dispersion over several class intervals in Diagram II (or *vice versa*, if they thought in terms of a specific money amount).

There is some suggestion of (a) in 1948-49 and 1952-53 (*i.e.*, during 'restraint' and recession), when around 80 per cent of the money increases recorded in Diagram II were flat-rate advances while only 50 to 60 per cent of the increases recorded in Diagram III were equal-percentage advances; and there is a hint of the opposite effect in 1954-56, when the proportion of

equal-percentage increases was appreciably higher than that of flat-rate money increases.¹

(b) is harder to check. To be certain that people were exclusively 'attached' to a specific money or percentage increase at a particular time, we should, as has been said, expect to find a marked difference between the two diagrams in the patterns exhibited. On the whole we do not: perhaps the only hint is in 1952-53, when there was a concentration in the 5s. and 7s. class intervals, with a slightly wider dispersion in the percentage changes.

A partial explanation of the absence of emphatic differences between the two diagrams may be that throughout most of the period a fairly large proportion of agreements have involved changes in both money and percentage differentials (*e.g.*, 'restitutions' of earlier wage relativities in favour of higher-paid grades or, sometimes, 'disproportionate' upward revisions of the rates of lower-paid workers).

At this point we should look for signs of 'leadership' in both money and percentage runs.

If we take the runs of Table I,² we find that electricity supply led in three (the 3s. run from 9/48 to 3/49, the 9s. run from 3/57 to 8/57 and the 11s. run from 1/55 to 7/55). London Transport buses also led in three (the 7s. run from 1/54 to 12/54, the 8s. run from 10/55 to 12/55, and the 9s. run from 1/51 to 6/51), while company and municipal buses appear to have led the 11s. run from 12/55 to 4/56. Retail co-operatives, again, led in three runs (the 6s. runs from 7/50 to 12/50 and from 6/59 to 11/59, and the 10s. run from 9/54 to 9/56). Gas led the 5s. run from 2/48 to 7/49, and electrical contracting the 5s. run from 6/50 to 2/51. One or other of these was, moreover, near the lead in a number of other runs—as were also, notably, the railways.

Taking the more specific money runs listed in Table II, we find the picture largely confirmed: electricity supply led in two cases, and electrical contracting, the railways, gas and the retail co-operatives in one each.

In the percentage runs of Table III, electricity supply was near the lead in several runs (notably in the 5 per cent run from 10/51 to 7/53); London Transport buses led in three (the 4 per cent run from 1/54 to 12/54, the 6 per cent run from 2/48 to 8/49 and the 8 per cent run from 10/55 to 3/56), coming near the lead in several other runs. Railwaymen led in the 7 per cent run from 1/55 to 7/56, and were near-leaders in three others (the 3 per cent run from 5/58 to 9/59, the 4 per cent run from 1/48 to 4/48 and the 8 per cent run from 9/54 to 4/55). Retail co-operatives led the last-mentioned 8 per cent run, and were near-leaders on more than one other occasion. The engineering industry deserves a special note, if only because it has so often been suggested as a leader. It led in the 11s. run of 11/50 to 5/51 and in the 4 per cent, 5 per cent and 8 per cent runs of 1948 to 1950; but since the ending of the wage

¹ Even this effect may be exaggerated, since the difficulty of finding appropriate original rates made it impossible to record a spread of percentage increases even though there was sometimes reason to suspect that this had in fact happened.

² Including the four 'sub-runs' listed in note 5 to that table.

freeze engineering settlements have regularly occurred towards the middle of both money and percentage runs (eight of the former and six of the latter). The only exceptions are the 11s. run of 4/57 to 10/57 and the 5 per cent run of 1/54 to 2/55, where engineering seems to have been a near-leader.

The emergence of electricity supply, London Transport buses, and the railways confirms to some extent one of the prevalent impressions—that nationalised industries tend to lead (on the grounds that, in the absence of the profit-motive, the 'employer' can be induced to pay anything asked for). Further, those workers in service industries—for instance, on the buses and on the railways—who are paid standard and not minimum rates are sometimes thought to be 'natural' (*i.e.*, expected) leaders, since they have the least opportunity of building up (by piecework, voluntary overtime, production bonuses, etc.) a substantial earnings margin above their wage rates. Since for this reason they are always tending to 'fall behind' workers in manufacturing industries, it is not surprising if the wage pressure tends to originate from them. However, once they have succeeded in 'catching up', the others tend to follow, presumably in the cause of maintaining previous inter-industrial wage relativities; so that their efforts are soon frustrated. This impression is also confirmed to some extent—but only to some extent: the alleged leadership of standard-rate industries, like the alleged leadership of nationalised industries, is certainly not to be taken as axiomatic.

(3) *Inclusiveness*

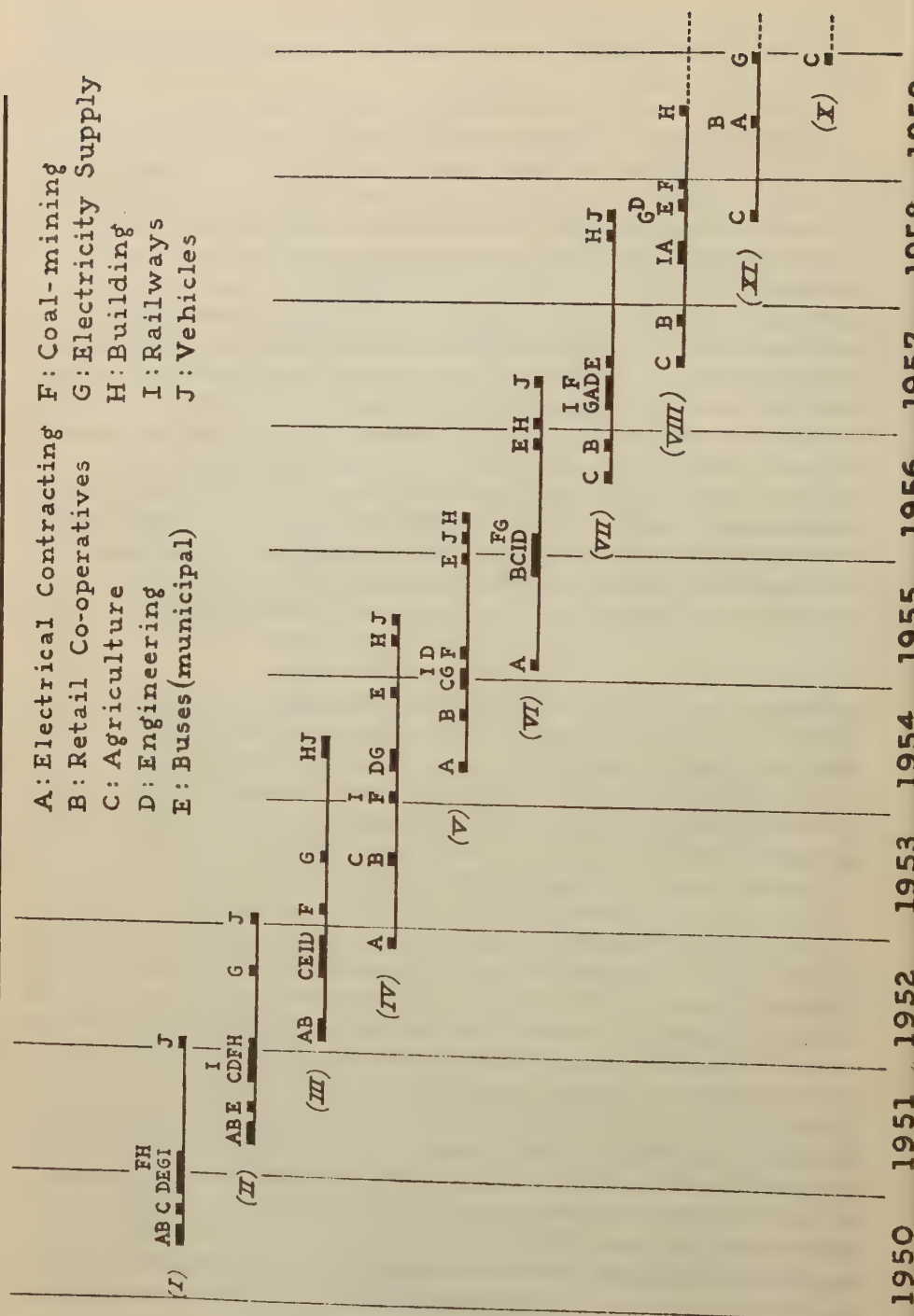
What we look for here is regularity in the composition of successive wage rounds: *i.e.*, the round is defined by the time taken for all bargaining units of a given group to get their increases. It is impossible to isolate such a pattern without making a drastic selection, for any industries which conclude their bargains infrequently—as some obviously do—will obscure the quite distinct pattern established by the 'regulars'. For the sake of simplicity, we have selected only ten industries. (See Diagram IV.)

The choice of a starting point is necessarily arbitrary, although there seems to be some plausibility in starting, as we have, from the end of the wage-freeze in 1950. Our method from this point was to list and number each successive increase of each of the ten industries: 'round' I thus comprises all the first increases, 'round' II all the second, and so on. Each of the industries concluded at least seven agreements within the period, some as many as nine. The series begins with a break-through by the E.T.U. (a member of the Joint Industrial Council for electrical contracting); and from this point the rounds are clearly distinguishable, although there is always a good deal of overlap. Table IV (p. 20) shows the ranking of the industries in successive rounds: a horizontal reading of it shows that most of them maintained a fairly consistent position although, as can be seen from the diagram, there is considerable variation in the spacing within each round.¹ However, for several groups there is a decisive break in order: electrical contracting

¹ See also p. 21.

IV: Successions of Certain Industries in the Wage-Rounds of 1950-59

- A: Electrical Contracting
- B: Retail Co-operatives
- C: Agriculture
- D: Engineering
- E: Buses (municipal)
- F: Coal-mining
- G: Electricity Supply
- H: Building
- I: Railways
- J: Vehicles



ceases to lead after round V, when agriculture takes over; buses fall back after round III; and railways climb markedly. Electricity supply, which has been noted as a 'leader' in other contexts, has no very stable role in this; but retail co-operatives, which have figured in some degree in every pattern examined, are regular 'near-leaders' here.

These are simply successions of bargains, which are not necessarily close to each other in time. There is, as might be expected, virtually no trace of similarity in the money increases secured; and the few similarities which are found are those which exist between associated bargains (*e.g.*, engineering and vehicles). These similarities tend to persist regardless of the particular rounds into which the bargains fall; thus, in the 'overlap' between round V and round VI, vehicle workers got 10s. to 12s. 10d. and engineering workers 9s. 6d. and 12s. 6d., although this was the fifth increase recorded for vehicles and the sixth for engineering. There is also very little similarity in the percentages secured, except perhaps on two occasions (from February to November 1951, where there was a tendency to 8 per cent; and from November 1956 to May 1957, where as we know¹ there was a strong run on 5 per cent).

Unlike the similarities in money amounts, however, the similar percentages seem to obtain between diverse industries; and this confirms the impression one gets from looking at lists of those obtaining similar percentages—namely that if any type of increase is 'contagious' from one industry to another it is the percentage form rather than the money form.

Conclusions

The above is no more than a first look at the most readily accessible data, restricted as these are, in the hope of tracing some pattern of wage rounds. Perhaps our most obvious omission is any reference to the details of the bargains considered—*i.e.* of the claims² and counter-offers which generally precede them, the degree of publicity by which these early moves are accompanied, and in general the extent of prior knowledge. Clearly these are factors which may very well determine subsequent attitudes (and therefore the eventual bargains); but equally clearly they are not the sort of factors to be recorded systematically.

Another obvious gap in our treatment is the absence of any estimates of the relative numbers affected by different wage bargains; but here, surprisingly enough, there is again no systematic public knowledge. Obviously the numbers of workers employed in different industries is readily available; but this may often be no sort of clue to the numbers of workers covered by the

¹ See Diagram III.

² A chart of wage demands for 24 'major negotiating groups' (comprising 7 million workers), over the period 1958-60, has been compiled by the National Institute of Economic and Social Research in its *Economic Review* for November 1960. The chart is based on information from trade unions and on the *Ministry of Labour Gazette*; and it should, if continued, prove a valuable source for future enquiries on the timing of claims and of dates of operation of increases, on the periods elapsing between the two, and on the percentage changes in hourly rates of wages.

TABLE IV
Succession of Ten Bargaining Units in Wage Rounds from Mid-1950 to End 1959

	<i>Order in round</i>									
	I (6/50 to 1/52)	II (4/51 to 1/53)	III (2/52 to 6/54)	IV (11/53 to 6/55)	V (4/54 to 4/56)	IV (2/55 to 5/57)	VII (8/56 to 9/58)	VIII (7/57-)	IX (9/58-)	X (12/59-)
<i>Bargaining unit</i>										
Electrical contracting	1	1	1	1	1	1	5	4	3	—
Retail Co-ops.	2	2	2	3	2	2	2	2	2	—
Agriculture	3	4	3	2	3	3	1	1	1	1
Engineering	4	6	6	6	6	7	7	5	—	—
Bus (municipal)	5	3	4	8	8	8	8	7	—	—
Coal-mining	6	7	7	5	7	6	6	8	—	—
Electricity supply	7	9	8	7	5	5	4	6	4	—
Building	8	8	9	9	10	9	9	9	—	—
Railways	9	5	5	4	4	4	3	3	—	—
Vehicles	10	10	10	10	9	10	10	—	—	—

separate bargains of a proliferation of unions. However, even if one were clear about the relative numbers affected, these numbers would not necessarily provide a yardstick of relative importance: is a bargain involving twice as many workers as another necessarily twice as significant?

In spite of these and other limitations, the grouping of the data does suggest pattern. There are in fact several distinguishable patterns, each of them phased differently: the timing of (1) successive groups of settlements, (2) sequences of similar-sized wage increases, and (3) the securing of increases by a given selection of industries, would appear to be largely independent. The precise dating of all these patterns is necessarily more or less arbitrary, but their phasing can be described approximately. If (1) is compared with (2), all that can be said is that there is an understandable tendency for some of the peaks in the numbers of agreements to coincide with the emergence of several simultaneous (money or percentage) runs. (3), however, bears little relation to either of the others.

The phasing of (1) and (2) has already been indicated diagrammatically; but the phasing of (3) requires a little explanation. The sequences ('successions') of Diagram IV vary from 20 to over 30 months; but since we have taken only ten selected industries, the length of these sequences means very little. What is important is the time elapsing between successive increases secured by particular industries, and these may be summarised as follows:

Time elapsing between increases, in months

	under 10	10-11	12-13	14-15	16-17	18-19	20 and over	Total
<i>Number of increases</i>	8	18	17	15	8	5	3	74

Each of the selected industries occasionally had considerably longer than a year between increases; but these relatively long periods did not in fact coincide. Some industries had far longer between increases than those we selected: indeed, if we were to have included all the recorded agreements, we should have found that to wait for a fully-inclusive wage round (*i.e.*, for everyone to have got a nationally-negotiated wage increase) would be like waiting for Godot. On this showing there is no question of an annual wage round in the Cohen Council sense (*i.e.* 'all wage earners' getting an increase every year); nor, even, do the sequences start at regular annual intervals—these intervals ranging between 9 and 18 months.

Nor is there an annual pattern in (1) or (2)—although here it must be remembered that we are dealing with groups of agreements which may well (and sometimes do) include more than one occurrence for the same industry. There is no very marked annual cycle—nor even a discernible seasonal pattern—in Diagram I; there is certainly none in Diagrams II and III—where annual wage rounds would imply that particular years were characterised by a particular money or percentage amount (or amounts). There are, in all four diagrams, discernible patterns; but in none of them is there any indication of regular periodicity.

Since however we have been looking at different aspects of a single set of data, the four diagrams are not basically inconsistent with each other. The wage freeze ending in 1950, the Korean war in 1950-51, the recession of 1952-53, the degree of unemployment, and the sharper rises in the cost of living, have left characteristic marks on each.

Thus the breakdown of wage restraint by the third quarter of 1948, and the relative success of the wage freeze up to the second quarter of 1950, is reflected in the fluctuations of Diagram I—and in marked gaps in Diagrams II and III: these gaps being immediately preceded by concentrations in the lower money and percentage ranges. The boom which accompanied the Korean war produced a strong peak in Diagram I, some high money runs in Diagram II, and the highest percentage increases in Diagram III.

The recession of 1952-53 was accompanied by a general falling-off in the numbers of wage agreements (Diagram I), and a less marked periodicity in their incidence. The money and percentage increases (Diagrams II and III) declined. By the beginning of 1954, however, the recovery began to be marked by a new series of wage increases in the higher money ranges (there were not, however, the very high percentage runs of 1950-51). These big increases were tending to tail off again by the end of 1957, as a further recession began to be felt.

Little light is thrown on the connection between changes in wage rates and the sharp rises in the cost of living. During the period, the cost of living rose sharply in 1950-51, 1954-55, and to a lesser extent in 1957; and these rises were accompanied (rather than preceded or followed) by runs of high money and percentage increases—and, in the first and last instances, by a marked bunching of wage agreements in time. It is worth noting (Diagram III) that the sharper the rise in the cost of living, the higher the percentage increase in which there were significant runs. This effect is not perceptible in money terms, because of the decline in the real value of money.

If it is asked whether unemployment fluctuations leave any mark on wage rounds, the answer has to be more tentative. If unemployment were lagged by six months, there would appear to be some coincidence of peaks and troughs with those in the incidence of wage settlements (as given in Diagram I) between 1948 and 1951, and again in 1955-56; but the periods 1952-54 and 1957-59 would—if such a connection were held to operate—imply longer lags. This gives some slight support to the reasonable contention that wage pressure is more responsive to the unemployment situation at a time when unemployment is low. Diagram IV suggests no more, in this context, than that the gaps between settlements (important settlements at least) tend to get longer in periods when full employment is less full than usual.

It is probably not very reasonable to suppose that unemployment, as distinct from other cyclical influences, would have had a very marked effect on the scale of increases in money or percentage terms; but there may very possibly have been some effect on wage differentials within industries. As is well-known, wage changes had for a long time—since the first world war—

tended to be made on a flat-rate basis. This had the effect that percentage differentials between the different grades of workers in the same industry were narrowed whenever wages rose, and were widened when they fell. Various 'market interpretations' of this apparently institutional fact were offered; for example, it was 'natural' that the relative values of skilled and unskilled should alter with the economic climate; during depressions, the skill differential 'inevitably' widened because unskilled workers were the more expendable (and their bargaining position was consequently less strong)—and *vice versa* during booms. The war was a boom *par excellence*: and by the end of it differentials had been narrowed so much that their appropriateness at existing levels began to be questioned. During 1948-51 several differential wage agreements had been concluded with the intention of halting, or even reversing, the narrowing process. In the recession of 1952-53, however (*i.e.* just when one would *not* expect it), there was a marked concentration of flat-rate settlements, as is apparent to some extent in Diagram II. To account for this minor paradox, it may be suggested (1) that the recession was much too slight appreciably to weaken the bargaining power of the lower-paid, and (2) that since, given minimum concessions to the lower-paid, differentiated wage increases cost more in aggregate than flat-rate increases, the latter ought really to be expected in times of stringency. The relapse into flat-rate settlements was in fact short-lived, and differentiated increases were resumed as soon as the recession was over.¹

Obviously this is not the whole story. Other economic influences—for example, the productivity and (to judge from the 'folklore' of trade union argumentation) the profitability of particular industries—can hardly be deemed irrelevant to wage determination; but the available series are usually too unreliable, or too insensitive, for it to be possible to make out a plausible case—at any rate over industry at large—for particular relationships.

Nor must the purely institutional interpretations be neglected—in particular, the widely canvassed view that the 'constellations' theory provides an adequate explanation of wage movements (even though it is never clear whether 'movements' in time, in money, or in percentages, are being 'explained'). If all that is being said is that all wage changes are interdependent, but that some are more interdependent than others, this is an unexceptionable platitude. But if it is suggested that there are institutional forces at work analogous to the ineluctable links of the universe, this is a different story. The instances of cosmic order are few. Perhaps the most obvious case is the tie-up of engineering and shipbuilding, where a single body—the Confederation of Shipbuilding and Engineering Unions—is concerned with two separate employers' federations. Agreements for these two industries always come close together, and the increases also tend to keep

¹ If we take the settlements recorded in the 'runs' of Table I, we find that over 80 per cent of these were for flat-rate increases during 1952-53, whereas the proportion during 1954-56 was under 45 per cent. This difference shows up, for instance, in the breakdown of the long run in the 7s. range (Table I, note 5): the second for the four 'sub-runs' is marked by a relative concentration of flat-rate increases,

step; and, as we have noted, certain other agreements are pretty regularly associated with them. Wages Council industries, again, have often been held to follow each other—as for example in clothing; and the retail trades have also shown signs of unity.¹

It is not hard to single out significant coincidences in timing or in similarity of increases; but if we think of 'constellations' in the narrow sense (*i.e.*, industries which traditionally settle together) we can hardly hope to explain more than fragments of the whole picture by reference to these. If we think of constellations in a wider sense, and consider all regular forms of communication between different organisations concerned with wage settlement, we may be on more hopeful ground. It is a commonplace that there are unifying forces at work: the 'omnipresence' of the general workers' unions, for instance, the 'interlocking' of Wages Councils, and the inevitable sensitivity of arbitrators to their own previous decisions and those of others,² are alone enough to ensure that wage settlements are seldom made in a total vacuum. But to stress the unifying forces at work is not to explain the diversity of patterns of settlements, still less the marked changes in these patterns that have been observed from time to time. Here, it may be suggested that major wage disputes (such as those of the engineers, busmen and railwaymen during the past five years) have left some mark on neighbour settlements, in that the outbreak of such disputes may have inhibited settlements in lesser industries for a time, until the 'pattern' could be reset according to the eventual result of the dispute. But even such disputes can hardly be more than straws in the 'wind of change': the direction of the wind still has to be accounted for.

The wage round is, in fact, far more complex than popular views would suggest, and certainly too complex to be accounted for by single explanations. If one asks what is the net effect of it all, it can be said that—on average and in the long run—the complexity results in certain broad similarities though certainly not in rigid uniformity. Thus if we were to take 'characteristic'³ wage rates for men from each of the ten industries of Diagram IV, we should find that, between 1950 and 1958, seven of these increased by between 60 and

¹ For instance, between June and October 1959, six different retail trades secured flat-rate increases of 6s.

² '... in arriving at their decisions, such bodies appear to give much weight to ... changes which have recently occurred in the wage rates of other industries, particularly those changes which have been the result of awards by the same body. The ultimate result may pay only slight regard to the current circumstances of the industry concerned and generally little attempt will have been made to take into account the overall circumstances of the country' (British Employers' Confederation, *Report to Conference on Industrial Relations*, October 16th–17th, 1958).

³ The rates taken were as follows (approximate weights given in brackets where appropriate): *electricity supply*, electricians in 'provincial areas'; *electrical contracting*, electricians in 'grade B areas (other areas)'; *building*, craftsmen (3) and labourers (1) in 'grade A areas'; *vehicle building*, craftsmen in 'other areas'; *coal mining*, underground workers (4) and surface workers (1); *railways*, driver's maximum rate (37) and porter's maximum rate (52); *municipal buses*, drivers' maximum rate in 'majority of areas'; *retail co-operatives*, shop assistants in 'provincial "A" areas'; *engineering*, fitters (3) and labourers (1); *agriculture*, minimum rate for England and Wales.

69 per cent, and the remaining three by 70 per cent or a little over.¹ This is typical of the 'modal experience' of industry at large (whether or not, for instance, the increases are secured by negotiation or by the operation of Wages Councils).² If we take representative wage rates for men in some 130 industries listed in the Ministry of Labour's *Time Rates of Wages and Hours of Labour*,³ we find that the percentage increases in these rates over the period (in this case from October 1949 to April 1959) were distributed as follows:

	Number of wage rates increasing by—				Total
	less than 60%	60% to 69%	70% to 79%	80% and over	
Skilled rates ...	25 (27)	38 (40)	25 (27)	6 (6)	94 (100)
Unskilled rates ...	23 (18)	53 (42)	40 (32)	10 (8)	126 (100)
All rates taken ...	48 (22)	91 (41)	65 (30)	16 (7)	220 (100)

(Figures in brackets are percentages of totals.)

In so far as there was a tendency for unskilled rates to rise by rather more than skilled rates, this supports a popular preconception about wage changes since the war. Any kind of generalisation about wage rates has to be qualified, of course, by the reminder that these rates are in some cases minimum rates and in other cases standard rates—in fact, that the importance of the wage rate (specifically, its importance as a component of the worker's pay-package) can be very different in different industries. However, this picture, such as it is, provides a summary illustration of how far wage rates have kept in step over a period of years.⁴ In so far as it is an orderly picture, the so-called wage round is partly responsible for the orderliness since it implies a tendency to generalise particular increases—to award them, for example, both to those groups whose productivity has been rising and to those whose productivity has not been rising but whose wage rates have been lagging behind. This apparent egalitarianism, involving as it does a tendency to freeze many historical wage relationships between industries, is not so much a product of principle as of 'free collective bargaining' under which every group tries to do at least as well as its neighbours.

¹ The percentage advances were: electricity supply 61, vehicle building 64, retail co-operatives 65, agriculture 66, railways and electrical contracting 67, municipal buses 69, building 70, coal mining 73, and engineering 74. In the ordering of the rates selected, only electricity supply and engineering changed station *vis-à-vis* their neighbours.

² If the rates of workers in 'Wages Council industries' are taken separately there appears to be no real difference in the character of the distribution from that of the one given above.

³ Where possible one 'typical' skilled rate and one unskilled rate (usually the labourer's) were selected from each industry of which details were given in both the 1949 and 1959 editions of *Time Rates of Wages*—the rates taken being those operative outside London, in the bigger provincial areas or industrial towns.

⁴ It should be noted, however, that an industry where wage rates rise frequently (say by a regular series of annual steps) will do better than one where the increases occur less frequently. For although the wages of both industries may eventually be found to have risen by the same percentage, the industry where increases occurred less frequently will have been lagging behind the other in the intervals.

If such a procedure is not to have an inflationary effect, the increases secured by those groups whose productivity is rising must be less than proportionate to the actual rise in their productivity, seeing that an equivalent increase will have to be granted to those whose productivity has not risen. But in practice strong bargaining groups will sometimes be able to secure an increase fully in proportion to their increased productivity and, when other groups follow suit irrespective of productivity increases, inflation pressure will build up. However, the pressure from this source is not continuous, if only because wage rounds do slacken and come to an end. It may well be argued that such pressure as is inherent in the wage round is too little and too rarely controlled; and Utopian alternatives—such as a modest uniform annual percentage increase to all (or a uniform annual money increase), geared to the overall rise in productivity, are sometimes advocated. But it must be remembered that the pressure on wage rates through successions of nationally negotiated increases is far from being the only form of wage pressure; for in many cases actual earnings are continuously being pushed up by local negotiation, and this tends either to widen the 'earnings gap' or to exert an additional pull on the rates. Moreover, any national wages policy (which, to be justified, would require a corresponding control of profits and prices) is felt to imply the virtual abandonment of trade union autonomy—and of others' autonomy.¹

¹ "Free collective bargaining" has become one of the most sacred of our very numerous sacred cows' (G. D. N. Worswick, 'Prices, Productivity and Incomes', *Oxford Economic Papers*, June 1958). Worswick, in this article, and T. Balogh (writing on 'Productivity and Inflation' in the same issue) argue, in effect, that there need be no harm in systematic and repetitive increases in wage rates (so long as they are systematic) as such, provided that 'productivity rises sufficiently to meet trade union demands without the need for a rise in prices' (Balogh); and (Worswick) that to attempt to restrain wage claims on the ground of the supposed dangers of 'excess demand' is liable to be self-defeating since production would tend to be curtailed and the necessary rise in productivity inhibited.

'BRITAIN, THE COMMONWEALTH AND EUROPE'¹

By M. FG. SCOTT

My chief concern in this paper is to consider how the interests of the United Kingdom and of the other members of the Commonwealth are likely to be affected, first, by the formation of the European Common Market and, second, by the various possible courses of action which might be taken by the Commonwealth in present circumstances. One such possibility which is worth considering, even if it has not met with much support, is that the United Kingdom should join the European Economic Community on the same terms as the present members. Another is the proposal which was put forward a year or two ago at the unofficial Commonwealth Relations Conference at Palmerston in New Zealand.² This was, very briefly, that the United Kingdom should join the Community on much the same terms as the present members, but that her food imports from the Commonwealth should remain largely duty-free, and that the rest of the Commonwealth should negotiate freer entry for their exports to the Community in exchange for the elimination of tariff preferences on their imports from the United Kingdom. A third possibility is that no attempt should be made to join the Community, but that the countries outside it should press for reductions in its external tariffs through the General Agreement on Tariffs and Trade.

A consideration of these various alternatives raises many issues with which I cannot deal here. I have little to say about their political implications, or how the interests of other European countries are likely to be affected, although both are, naturally, highly relevant to the negotiability of the proposals. Furthermore, the whole matter is very complex, and the nature and magnitude of all the repercussions of the measures taken cannot be easily foreseen or accurately gauged. I must apologise, therefore, for the inadequacy of this paper. The subject deserves more study than I have been able to give to it.

A summary of the paper is given on pp. 44 to 46.

The impact of the Common Market on the Commonwealth

What difference does the formation of the Common Market make to the existing situation? One difficulty about answering this question is that the full effects will be realised only after some years, since the reductions in tariffs within the Community, and the unification of external tariffs, will not be completed until then, and since the effects of these changes, even when they are completed, may take time to occur. To study the effects one therefore

¹ This paper was one of a number read at the Franco-British Economic Conference on 'Problems of European Trade' held in London in July 1960 under the aegis of *L'Institut Français du Royaume-Uni* and *L'Institut de Science Economique Appliquée*. The latter has published all the papers in French, and the writer is grateful for its permission to publish this paper here.

² See 'Links with the Common Market', Peter Thorneycroft, M.P., *The Manchester Guardian*, May 5th, 1959; and 'The European Economic Community and the Commonwealth', edited by C. E. Carrington, supplement to 'Western World', February 1960.

needs to know, *inter alia*, what the pattern of trade would be like 10 or 20 years hence in the absence of the Common Market as well as with it present. One cannot assume that the present pattern of trade would persist if there were no Common Market. Many believe that intra-European trade is likely to continue to grow faster than world trade, and if that were to happen the effects of the formation of the Common Market would be greater than a reference to the present trade pattern would suggest. This point is of some importance since in what follows I (inevitably) refer to the present trade pattern in order to assess the impact of the Common Market on the trade of the Commonwealth. Some allowance for future changes in the pattern must therefore be made.

The most direct and obvious effects of the Common Market are on flows of trade. For reasons given below, it is thought that some of these effects may be substantial, and so I shall discuss them at some length. It is the effects on real income which one would most like to be able, but which are amongst the most difficult, to assess. It is quite possible that they may only be very small. Other effects which will be considered are those on flows of capital and on the balance of payments.

The formation of the Common Market seems likely to have the following main direct¹ effects on trade between the Community and the rest of the world:

1. The Community's imports of all goods may rise in so far as the Common Market leads to an increase in the real income of its members.

2. The Community's imports of all goods may fall and its exports of all goods may rise in so far as the Common Market leads to a lowering of the money costs per unit of production of its members.

3. The Community's imports and exports of manufactures may fall as demand is diverted from countries outside the Community to countries inside it whose products can now be imported duty-free.

4. The Community's net imports of food, beverages and tobacco may fall in so far as the various measures taken to organise trade and production of agricultural products tend to stimulate production within the Community to a greater extent than they stimulate consumption. As imports of food, beverages and tobacco from the associated territories of the Community in Africa and elsewhere are also likely to rise on account of the reduction in the tariffs on them, imports from the rest of the world are likely to fall on this account as well.

5. The Community's imports of most industrial raw materials and petroleum are unlikely to be much affected by trade diversion. For most of them demand is inelastic and external tariffs are low or zero.

¹ In what follows, the effects listed do *not* assume that the balance of payments of the Community with the rest of the world is somehow kept in equilibrium. It is part of the purpose of the analysis to show what sort of disequilibrium in the balance of payments is likely to arise, and what adjustments will be needed.

The above statements are certainly too sweeping and over-simplified. All manufactured goods, for instance, will not behave similarly. Some may behave like raw materials (for example refined copper, on which the external tariff is zero, but which is classed as a manufacture in the Standard International Trade Classification). Nevertheless, it is thought that they contain sufficient truth to make the following analysis of some use.

There are some reasons for believing that the net effect of 1 and 2 on imports into the Community may be small in relation to the possible effects of 3 and 4, at least over the next 10 to 12 years, and so far as the effects on real income, 1, and costs, 2, of the increase in international specialization and division of labour resulting from the lowering of tariffs are concerned. The effects of changes in the degree of competition could be greater, and are discussed further below (p. 31). Some estimates have been made of the effects of changes in tariffs on trade and real income, and they suggest that, although trade may be substantially affected, real income is likely to be little changed. Thus J. Wemelsfelder has estimated that the reductions in Germany's tariffs on imports of finished manufactures in 1956 and 1957, which rather more than halved the existing rate of tariff and probably reduced the price of imports of finished manufactures by 10 to 12½ per cent, increased these imports by about 100 per cent. Despite this large percentage increase, the effect on Germany's real income may have been to increase it by something of the order of 0.2 per cent. The effect was small because the absolute increase in imports was small in relation to the national income.¹ T. Scitovsky, using P. J. Verdoorn's estimates² of the effects of a Customs Union between the six countries in the European Economic Community, the three Scandinavian countries and the United Kingdom on their trade, calculates that the increased specialization of trade might increase their real income by less than 0.05 per cent.³ The improvement in their terms of trade, resulting from the direct effects of the tariff changes together with exchange rate adjustments necessary to keep their balance of payments in equilibrium, might improve their real incomes by about 7 times as much,⁴ but even this is very small. The changes in trade, as estimated by Verdoorn, would be much greater than this. Thus, before the exchange rate changes necessary to regain equilibrium in the balance of payments, trade in the products included in the study⁵ between the members of Verdoorn's Customs Union would increase by 19 per cent, and imports from the rest of the world would fall by 6 per cent. After the exchange rate adjustments the corresponding percentages would be 14 per cent and 1½ per

¹ J. Wemelsfelder, 'The Short-term Effect of the Lowering of Import Duties in Germany', *The Economic Journal*, Vol. LXX, March 1960, pp. 94-104.

² P. J. Verdoorn; 'Liberalization: The Expected Changes in the Pattern of Trade', mimeographed paper, prepared as part of the preparatory work for the Economic and Social Conference, European Movement.

³ T. Scitovsky, *Economic Theory and Western European Integration*, London, 1958, p. 67.

⁴ *Ibid.*, p. 66.

⁵ That is, roughly speaking, all products except raw materials and steel, which it was assumed would be little affected by the customs union.

cent. Exports to countries outside the union would be lowered by about 6 per cent.¹

In fact, these may be under-estimates of the probable size of the changes in trade. This is apparently Verdoorn's own view, and Scitovsky shares it.² Even if the changes were much larger, however, the effects on real income would still be small. That the changes in trade would probably be larger is suggested by Wemelsfelder's study mentioned above, by the 50 per cent increase in Benelux trade that followed the establishment of a customs union between these countries,³ by the 40 to 50 per cent fall in the volume of the United Kingdom's imports of manufactures which followed the imposition of import duties and the devaluation of the pound in 1931-32³ and by the often very large increases in imports of food into the United Kingdom which followed the reduction and removal of import duties on them in the middle of the nineteenth century.⁴ There are doubtless other instances where large changes in the flows of trade, of the order of 50 per cent or even more, have followed the imposition or removal of tariffs. In the examples given above it is trade in manufactures and foodstuffs (including beverages and tobacco) which was principally affected, and it seems reasonable to suppose that it is these commodities which would also show the greatest changes as a result of the formation of the European Common Market. It seems best, therefore, to concentrate our attention on the possible changes in trade in manufactures and foodstuffs (items 3 and 4 in the list of effects of the Common Market on p. 2) and to ignore the effects *via* changes in real incomes, the general level of costs and diversion of trade in raw materials and petroleum (items 1, 2 and 5).

Before continuing the analysis on these lines, there is an important reservation to the above conclusion which must be made. The effects on real income which were discussed above were the effects which arose from greater international specialisation and division of labour, the gains per unit of commodity traded being measured by the difference between the costs of domestically produced and imported goods, and hence (initially) by the height of the tariff which was lowered or removed. The gains were a function of the height of the tariff and the increase in trade, and since the latter was always small in relation to the national income, even though large in relation to the existing trade flows, the gains were small in relation to the national income. That being so, it seemed reasonable to suppose that the effects on the general level of costs, and on the demand for raw materials, would also be small. But there is another way in which the formation of a Customs Union could affect real incomes and costs and that is by changing the degree of competition.

¹ *Ibid.*, p. 65.

² *Ibid.*, p. 67.

³ From 1931 to 1932 the volume of retained imports of manufactures (Classes III, IV and V, excluding IIID, non-ferrous metals and manufactures, IIIA, coke and manufactured fuel, IIIO, oils, fats and resins manufactured (including refined petroleum)) fell by 44 per cent. In the same period industrial production in the U.K., and probably also total sales of manufactures on the home market, barely changed. The average incidence of the tariffs imposed on imports of these manufactures was about 10 to 12 per cent.

⁴ See W. Schlote, *British Overseas Trade from 1700 to the 1930's*, Oxford, 1952, pp. 60-64.

If, as a result of the greater freedom of trade, industry became more competitive, this might stimulate producers to lower costs and to produce more standardised articles by means of cheaper mass-production methods.¹ It does not seem possible to say how important the effects of such changes on real incomes and costs would be, but in the long run they *might* be substantial. So far as imports into the Community are concerned, the effects would to some extent cancel out, since the higher real incomes would tend to increase them, whereas the lower money costs would tend to decrease them. Imports of raw materials, however, would almost certainly be increased, since production of many of these within the Community is small in relation to consumption. Exports would, in general, be stimulated by the lowering of costs. In what follows these possibilities are for the most part ignored, though the reader is reminded from time to time of their existence.

Since it is trade in manufactures and foodstuffs which is likely to be affected substantially by the formation of the Common Market, it is interesting to see the relative importance of such trade in the total exports of the Commonwealth countries. Table I gives some figures for 1958.

TABLE I

Exports of manufactures and foodstuffs to the E.E.C. and the rest of the world as percentages of exports of all commodities to all areas in 1958 for certain Commonwealth countries

Country	To E.E.C. (1)	To rest of world (2)
Ghana	30	39
British East Africa ¹	11	45
United Kingdom	11	81
Canada	6	57
Nigeria	5	21
Union of South Africa	5	2
Hong Kong	4	88
India	4	76
Federation of Rhodesia and Nyasaland	2	2
Malaya and Singapore	2	20
Australia	2	45
Pakistan	1	2
New Zealand	1	59
Trinidad and Tobago	1	17

¹ Kenya, Uganda and Tanganyika.

² Means 'not available'.

Note.—For sources and methods see the Appendix. The percentages show, for example, that 30 per cent of Ghana's total exports of all commodities to all areas consisted of exports of food and manufactures to E.E.C. countries. 'Food' is S.I.T.C. Sections 0 and 1, 'food beverages and tobacco', and 'manufacturers' is S.I.T.C. Sections 5, 6, 7, 8 and 9. Exports of some commodities, classified as 'Manufactures' in the S.I.T.C., were excluded for some countries as follows: Ghana, gems; Canada, copper and nickel; Union of South Africa, gems and copper; Federation of Rhodesia and Nyasaland, copper; Malaya and Singapore, tin.

The countries in the Table are arranged in descending order of the importance of exports of food and manufactures to the Community in relation to their total export to all areas (Column (1)). They range from Ghana, 30 per cent of whose total exports to all areas consist of food and manufactures sent to the Community, to Trinidad and Tobago for whom the corresponding

¹ See T. Scitovsky, *op. cit.*, pp. 31, 32. On p. 76 Scitovsky concludes that the Common Market 'is likely to exert its beneficial influence more through its effects on the degree and nature of competition than through the greater intra-European specialization it renders possible'.

proportion is a mere 1 per cent. The percentages in Column (1) are only a crude measure of the vulnerability of each country's exports to the effects of the formation of the Common Market. Other relevant factors are the height of the common external tariff, the extent to which other measures (import quotas, levies, etc.) are used to protect producers within the Community, and the various elasticities of demand and supply. Nevertheless, the percentages are so small for the countries below India in the Table that it seems unlikely that any conceivable fall in exports to the Community would cause them serious harm.

The countries whose exports might be seriously affected fall into two groups: those for whom one commodity is of very great importance (Ghana, British East Africa, Canada, Nigeria, and the Union of South Africa) and those whose interests are more widely spread.

By far the greater part of Ghana's and Nigeria's exports of food to the Community consist of cocoa, for which the common external tariff is to be 9 per cent. The Associated Territories of the Community will escape this tariff and so there is likely to be a diversion of Ghana's and Nigeria's exports away from the Community and towards other countries. In the short run, since consumption and production of cocoa within the Community and its Associated Territories are unlikely to be much affected, Ghana and Nigeria will not suffer appreciably. What they lose in exports to Germany, say, they will make up in exports to the U.S.A., for example. In the long run, however, there may be some increase in production in the Associated Territories or reduction in consumption in the Community as a result of the higher price,¹ and to the extent that this occurs Ghana's and Nigeria's exports may be reduced, and the world price of cocoa may be forced down.

About four-fifths of British East Africa's exports to the Community of food and manufactures consist of coffee, and the position here is similar to that of cocoa, though with a higher external tariff of 16 per cent.

Canada is not so dependent on the export of one commodity as the African countries just mentioned, but about a third of her exports of food and manufactures to the Community consist of wheat and other cereals, mostly wheat. These exports might be seriously reduced if the agricultural policies followed by the Community stimulated its output of wheat, even by only a small proportionate amount. About 60 per cent of Canada's exports of food and manufactures to the Community are manufactures, worth some (U.S.) \$180 millions in 1958. They consist mainly of machinery and transport equipment, which might fall appreciably.

Nearly two-thirds of the Union of South Africa's exports of food to the Community consist of maize, and the position here is similar to that of Canadian wheat. Most of the rest of her exports are fresh fruit and nuts, mostly oranges, and although there is a common tariff of 15 per cent to be surmounted, the seasonal difference should protect them to some extent.

¹ And also, possibly, as a result of increased investment in the Associated Territories out of the special fund available for that purpose, or on account of the freer movement of capital brought about by the Common Market.

The United Kingdom's and Hong Kong's exports to the Community are predominantly manufactures. For India, the ratio of food to manufactures is roughly 2:3. The United Kingdom is much more dependent on this market than Hong Kong and India, and could suffer an appreciable drop in her exports to it. Hong Kong and India might, indeed, benefit substantially from the removal of all import quotas on manufactures imported into the Community, if they ever are removed in accordance with the provisions of the G.A.T.T.

In seeking to assess the impact of the Common Market on the trade of the Commonwealth one should not confine oneself to the latter's exports to the former. Some countries may recoup at least some of their losses on exports to the Community by selling more to other countries. As we saw above, Ghana may export less cocoa to the Community, but more to other countries. These extra exports would be stimulated both by the greater supplies made available in the exporting countries, and by the greater demand in countries outside the Community, whose imports from the Community (or from the Associated Territories) would fall. Unless the Common Market led to an appreciable fall in manufacturing costs, the removal of internal tariffs would tend to reduce the supply of exports of manufactures to other countries and so the United Kingdom, Canada, Hong Kong and India might benefit on that account. For the United Kingdom there is also the possibility of replacing with her own exports those from the Community to the countries in the European Free Trade Area, since in these markets United Kingdom exports will escape paying duty, whereas the Community's exports will continue to pay it.

The exporters of foodstuffs would make similar compensating gains, but they might also lose in a way which would not afflict the manufacturing exporters. If the Community's agricultural policies had a marked protective effect, and tended to stimulate production of food more than consumption, even by only a small proportional amount, this might appreciably reduce the price of food entering into international trade.¹ It seems unlikely that the prices of manufactured goods will be depressed in the same way, partly because the common external tariff will almost certainly not be higher, and may well be substantially lower, than the average level of existing tariffs.² Unfortunately, there is less certainty about the effects of the Community's agricultural policies, since these are not confined to the fixing of a common external tariff, but include variable import levies and quotas, as well as various measures designed to improve the efficiency of agricultural production.³ If the net effect of these measures was to reduce the price of foodstuffs entering into international trade the net exporters of foodstuffs (including beverages

¹ See ' *Trends in International Trade* ', a report by a panel of experts to the contracting parties to the G.A.T.T., Geneva, 1958, especially Chapter IV.

² Proposals have recently been made to cut the external common tariff by 20 per cent. Any such cuts would tend to reduce the falls in exports of manufactures to the Community, and at some point they would be turned into increases. See also below, pp. 42 to 44.

³ It is doubtful whether the Community's agricultural policies are going to be in accor-

and tobacco) in the Commonwealth, by far the majority of the members of it, would lose on that account. The United Kingdom, India,¹ Ceylon,¹ Malaya and Hong Kong would gain.

How far does the above account of the effects of the formation of the Common Market on Commonwealth trade need modification to allow for probable future changes in the structure of that trade? I shall only consider two possibilities here: first, the Community's imports may grow faster than other countries' imports, so that the percentages shown in Column (1) of Table I may all increase; and, second, some Commonwealth countries may become more industrialized and the proportion of their exports consisting of manufactures may rise.

The fact that the Community's imports have, in recent years, risen much faster than those of other countries has been widely noticed. For some commentators this more rapid growth has constituted one of their chief reasons for deploring the failure, so far, of the United Kingdom to gain entry into the Common Market on the same terms as its members. Of course, even if the United Kingdom and the other members of the Commonwealth do not gain entry their exports should continue to share in the general growth of the market. There may be a fall, super-imposed upon this growth, due to the factors discussed in the preceding pages, but apart from that the growth should continue. Nevertheless, in assessing the importance of this fall, the existence of the growth is relevant. The more rapid is the growth the more damaging is any given percentage loss in our share of the market, for any such loss will have a greater effect in reducing the average rate of growth of all our exports.² The importance of this consideration depends on how much faster the Community's imports are likely to grow in the future than the imports of other countries, and on how far into the future one projects this faster rate of increase.³ Some evidence relevant to the first point is given in Table II.

dance with the rules of the G.A.T.T. Any import quotas maintained other than for balance of payments (or certain other minor) purposes are forbidden. The external duties and other regulations of commerce of a customs union should be no higher *nor more restrictive* than the general incidence of duties and regulations prior to its formation.

¹ India was a net exporter of food, beverages and tobacco in 1958. However, if tea is excluded on the grounds that the Community's consumption and production are small, so that the price of tea is unlikely to be much affected, India was then a substantial net importer. Ceylon's position was similar.

² H. G. Johnson has suggested that the argument that Britain would lose in the absence of a Free Trade Area because it would be cut off from the world's fastest-growing market is logically invalid. It is so, he claims, because the once-and-for-all reduction in our trade with the E.E.C. caused by the formation of their Customs Union would not stop our remaining exports from sharing in the growth of demand within the Community. If, however, the absence of a Free Trade Area reduces the proportion of our total exports which is subject to this rapid expansion of demand, then it seems that we *would* lose on this account. The argument is valid. See 'The Economic Gains from Freer Trade with Europe', *The Three Banks Review*, Sept., 1958.

³ If one were to look an indefinite distance into the future, then, no matter how small the margin between the rates of increase, so long as the Community's imports grew faster, they must eventually swallow up the whole of world imports. Since the future is so uncertain, it is unprofitable to project trends very far into it, and the calculations given below are for a period 20 years hence.

TABLE II

Percentage changes in the E.E.C. countries' and in the rest of the world's imports in various periods

<i>Period</i>							<i>E.E.C.</i>	<i>Rest of World</i>
1886-90 to 1901-5	...	...	...	...	...	...	50 ¹	52
1901-05 to 1913	...	...	...	...	...	...	79	75
1913 to 1928	...	...	...	...	...	...	30	84
1928 to 1938	...	...	...	...	...	...	-34	-32
1938 to 1953-55	...	...	...	...	...	...	212	284
1953-55 to 1956-58	...	...	...	...	...	...	38	22
1886-90 to 1956-58	...	...	...	...	...	...	892	1,457

¹ Excluding Belgium.

Note.—For sources and methods see the Appendix. Imports are measured in terms of current values expressed in U.S. dollars.

For the twenty-five years prior to 1913, the Community's imports grew at about the same rate as those of the rest of the world. Thereafter, until we get to the post-war period, they grew much more slowly, no doubt largely because of the two world wars. It is only in the last few years that the more rapid growth of the Community's imports has occurred. This more rapid growth may have owed something to the reduction of quantitative restrictions on imports, and, as most of these have now gone, it may not persist. It is therefore doubtful, to say the least of it, if one can confidently rely on a continuation of the recent more rapid rate of growth.

Nevertheless, as it is interesting to see the implications of assuming that it does continue, 'I have calculated what some of the percentages in the first column of Table I would be on certain very rough and ready assumptions. These are that (in the absence of a Common Market) each Commonwealth country's exports of food and manufactures to the Community grow at the same rate per annum as the Community's total imports from 1953-55 to 1956-58, that exports of food and manufactures to the rest of the world grow as fast as the rest of the world's total imports over the same period, and that all other exports (raw materials and fuels) grow as fast as world imports over that period. The effect of these assumptions is that in twenty years' time the percentages in column (1) of Table I would be approximately doubled, so that, for example, the United Kingdom's exports of food and manufactures to the Community would then represent 22 per cent instead of 11 per cent of her total exports of all products to all areas, Canada's percentage would rise from 7 to 14 per cent, India's from 4 to 8 per cent, and Australia's from 2 to 4 per cent. This suggests that the direct effect on exports to the Community of the formation of the Common Market might be substantially more than was suggested above, but the effects on the exports of countries below India in the Table would still be small.

The other modification of the present pattern of trade which the future may bring, and which I want to consider very briefly, is that resulting from the growing industrialization of Commonwealth countries. This may make some countries become smaller and smaller *net* importers of manufactures, or larger and larger net exporters of them,¹ and smaller and smaller net

¹ This is not to say that the absolute level of such countries' imports of manufactures will fall. The contrary is more probable.

exporters of foodstuffs, or larger and larger net importers of them. The impact of the Common Market on the trade of such countries will tend to approximate to the impact on the United Kingdom. They will tend to suffer less from protectionist agricultural policies in the Community and they may even gain from them. Their interests will be centred increasingly on the height of the common external tariff on manufactures.

This is all I have to say on the impact of the Common Market on the trade of the Commonwealth. To conclude this section I will make a few comments on the effects on the balance of payments and capital movements.

It seems quite likely that the formation of the Common Market will tend to improve its members' balance of payments with the outside world. Of the five effects listed on p. 2, numbers 2 and 4 tend to improve it and number 1 to worsen it. The net effect of 3 is uncertain and 5 small. In other words, any reduction in costs, and any reduction in net imports of food due to agricultural protection, will tend to improve the current balance of payments. A rise in real income, however, by increasing the demand for imports will tend to worsen it. As a result of trade diversion, both imports and exports of manufactures will tend to fall, so the net effect of this might be small, but I should be inclined to suppose that imports will fall more than exports. All these are changes in the *quantities* traded brought about by the formation of the Common Market, and my own guess is that they will, taken by themselves, tend to improve the current balance of payments.¹ Besides these, there will also probably be an improvement in the Community's terms of trade, so that an improvement in the current balance is even more likely. Furthermore, if there is a reduction in the net outflow of long-term capital from the Community (including the Associated Territories within the Community in this context), as seems quite likely,² the balance of payments in a wider sense will improve still more.

Whether this improvement in the balance of payments, if it occurs, will benefit or harm the Commonwealth depends very largely on what its balance of payments situation would have been in the absence of a Common Market. A weak balance of payments made worse could lead to deflationary policies which might reduce incomes and employment by substantial amounts. On the other hand, a strong balance of payments made less strong might be beneficial if it also implied that the Community's balance of payments, which would otherwise have been weak, was now satisfactory. For this might prevent deflationary policies being pursued by the Community, and such

¹ T. Scitovsky, *op. cit.*, p. 65, says that P. J. Verdoorn's estimates (referred to in footnote (2), p. 29 above), imply an improvement in the current balance of payments of his assumed customs union.

² This is not to say that there will *in fact* be a reduction in the flow of capital, but only that the effect of the formation of the Common Market will probably be to make the *net* outflow smaller than it would otherwise have been. There are several reasons for supposing this to be so. It has been said that American investors are already taking a keener interest in the Community. The greater freedom for capital movements within the Community may make it a more attractive place to invest. Germany may invest more in the Associated Territories at the expense of other underdeveloped regions.

policies could have undesirable repercussions on Commonwealth incomes and employment. As matters are at present, the first of these possibilities seems the more likely, but one cannot tell what the future may bring.

Particular Commonwealth countries may, of course, be affected differently from others. India is reported to be concerned at the possible loss of capital to her which may result from the operation of the Community's Development Fund. There may be increased investment, especially by Germany, in the Associated Territories at her expense.¹

To conclude, the formation of the Common Market will affect the Commonwealth in a variety of ways. The above analysis has tended to emphasise the damaging effects it might have. One cannot be certain about these, but that they *might* occur seems undeniable. The principal ones are the loss of exports to the Community only partially compensated by gains elsewhere, the fall in world food prices which might result from a protective agricultural policy within the Community (though this would benefit some members of the Commonwealth, and probably more as time goes on), and the worsening in the Commonwealth's balance of payments which might lead to deflationary measures being taken to deal with it. There are other possibilities, but there are also possible benefits. If the efficiency and real income of the Members of the Community were to be substantially increased, the Commonwealth's exports to it might rise, and imports from the Community might become cheaper and of better quality. Higher real incomes in the Community might mean more, and not less, savings available for investment in other countries, including the Commonwealth. Except for the effects on deflationary policies *via* the balance of payments, it does not seem to me very likely that these effects, whether good or bad, are likely to affect the level of real incomes in the Commonwealth as a whole by substantial amounts. Flows of trade may be changed by large amounts, so that particular groups of producers or consumers may gain or lose appreciably. But the effect on the general level of incomes will probably be small.

The United Kingdom as a full member of the Community

So far I have discussed the economic effects of the formation of the Common Market in terms of the difference it will make to the existing situation. This comparison, some might say, does not do justice to the case for the United Kingdom joining the Common Market. It may be true that, by staying out, we will suffer only a small loss of real income as compared with the existing situation; but if we were to join we might make an appreciable gain. Hence the economic penalty for not joining may be large. Furthermore, there may be a political penalty as well. My own view is that there is not a strong economic argument for joining the Community. I am less qualified to discuss the political argument, but this too seems weak. It must be remembered that the proposition is that the United Kingdom should join the Community on substantially the same terms as its existing members,

¹ See the supplement to '*Western World*', *op. cit.*, pp. 19-21.

Later on I consider the proposition that we should join on special terms, for which a stronger case can be made from the United Kingdom's point of view. But it is worth taking the first proposition, that we should join as a full member, since we might be accepted on those terms by the other members¹ but not on any other.

As has already been suggested,² the chief economic gains to the members of the Community may arise from the higher degree of competition which the freeing of trade promotes rather than from the readjustment of trade patterns or change in the terms of trade. If this is true, there is no *necessity* for the United Kingdom to join the Community in order to secure these gains. They could also be secured by more intensive measures to stimulate competition within this country (by legislation dealing with restrictive practices, for example) and, if it is thought worthwhile, and if the balance of payments can be kept in equilibrium fairly painlessly, by reducing tariffs on our own imports. It would naturally be even better if we could couple such tariff reductions with tariff reductions made by foreign countries on our exports to them. But we can negotiate these without joining the Community, for example through the G.A.T.T. An approach on these lines is considered below (p. 42). If the gains from increased competition are really substantial, however, and if free entry for imports really does lead to increased competition, it should be worth making unilateral tariff reductions if need be. The main objection to them is not their effect on the terms of trade, which would probably be small, but their effect on the balance of payments, which would probably be large. If we clung to our fixed foreign exchange rate, we might be forced to pursue damaging deflationary policies. My own view is that we could avoid these by varying our exchange rate,³ but this might not in fact be done.

There are various reasons why it would be undesirable for us to join the Community, and desirable to look for alternative means of securing its economic benefits such as those just mentioned. One of the principal objections to joining is the likely effect on our imports of food and on food prices in this country. The members of the Community at present pursue policies which keep the consumer prices of many staple foodstuffs above world market levels, and their intention seems to be to continue to do so.⁴ In

¹ Even this is doubtful. The acceptance of a new member necessitates ratification of the Treaty by the existing members all over again, and their governments might be reluctant to face this ordeal. France might be suspicious of the United Kingdom's intentions, and fear obstruction in the development of the Common Market. French businessmen may not want to face any more competition than they have taken on already.

² See p. 29.

³ See my 'What should be done about the Sterling Area?', in this BULLETIN, Vol. 21, No. 4, November 1959, pp. 244-251.

⁴ 'Furthermore, account should be taken of the fact that the conditions of production and characteristics of farms in the Community differ from those in the extra-European countries which are large-scale agricultural exporters. In addition, the prices of agricultural products on the market are still frequently distorted by artificial measures. This is why, generally speaking, these prices cannot be at the same level within the Community as that at present obtaining in the world market, but must be stabilised at a higher level.' From the proposals for a common agricultural policy in the E.E.C. made by the Commission of the E.E.C. as translated by *Political and Economic Planning*, Occasional Paper No. 5, February 1st, 1960, p. 7.

this country consumer (although not producer) prices are substantially the same as world market prices. Our system of deficiency payments to farmers, which enables them to receive higher than world market prices, is not regarded as practical on the Continent, since farming is much larger there in relation to the whole economy, and the size of the necessary deficiency payments would make it difficult to raise the money by taxation. A rise in food prices in this country would therefore be one effect of our joining the Community, and this would be objectionable both on social grounds and because of its effects on cost inflation.

Nor is this all. At present imports of most foodstuffs from the Commonwealth into this country are duty-free. Were we to join the Community we would have to impose duties on these imports and, in some cases, import quotas as well. Commonwealth producers would lose both because of the diversion of our imports from them towards the other members of the Community and their Associated Territories, and because the higher prices of food would reduce our total consumption of food. For many Commonwealth producers the United Kingdom is an important, often the most important, market for their food exports (see col. (1) of Table III).

Objections similar in kind, but much smaller in importance, arise on account of the effects of our joining the Community on our imports of raw materials. It has been stated that 70 per cent of our raw material imports which now enter duty-free will also enter the Community duty-free.¹ On much of the remainder the Community's tariffs will be low. But there are some products, such as aluminium and wood pulp, on which we should have to put a tariff (10 per cent and 6 per cent)² if they were imported from outside the Community, which would be undesirable both from the point of view of our own costs of production and from the point of view of Commonwealth producers (Canada in both these cases).

As far as our imports of manufactures are concerned, we need not fear any marked rise in prices in this country. Indeed the opposite might occur. But some Commonwealth producers would again suffer, notably Hong Kong, India and Canada (see col. (2) of Table III). As these and other Commonwealth countries became more industrialised, the disadvantages here would weigh more heavily.

Our exports to the other members of the Community would, of course, benefit from the removal of tariffs and other restrictions, but our exports to the Commonwealth would be adversely affected for two reasons. First, they could afford to buy less from us if their total exports fell, as they probably would on account of the restrictions imposed by us on their food exports to us. Second, they might reply to this reversal of Imperial Preference by increasing their tariffs on our exports to them. Some commentators have tended to belittle the importance of existing preferences. It has been pointed out that

¹ See F. Jenkin, 'Integration or Isolation?' *Crossbow*, Vol. 3, No. 11, Spring 1960, p. 12, referring to a study made on behalf of the Federal Trust for Education and Research.

² P. Jenkin, *loc. cit.*

TABLE III

Percentage of certain Commonwealth countries' exports of all commodities to all areas which consist of food and manufactures going to the United Kingdom and the E.E.C. in 1958.

Country	Exports to U.K.		Exports to E.E.C.	
	Food	Mfrs.	Food	Mfrs.
	(1)	(2)	(3)	(4)
New Zealand	42	—	1	—
India	19	6	1	2
Federation of Rhodesia and Nyasaland	17	2	2	1
Australia	17	3	1	1
Union of South Africa	(15)	(2)	5	—
Nigeria	14	2	5	—
British East Africa	14	5	10	1
Ghana	13	(—)	30	—
Trinidad	9	—	1	—
Canada	6	5	2	4
Pakistan	2	2	—	1
Malaya and Singapore	1	1	2	—
Hong Kong	—	12	—	4

Note.—For sources and methods see the Appendix. The figures in brackets are particularly uncertain.

they only affect a quarter or so of our exports, that their importance has been declining and is likely to continue to decline. It seems to me, however, that the benefit we derive from Imperial Preference is of the same order of magnitude as that which we would gain from the removal of tariffs on our exports to the Community.¹ It may be true that our preference margins are likely to be reduced in the future, and agreements we have concluded with Australia and New Zealand have indeed expressly provided for this. But we should not delude ourselves that the effects on our exports will be negligible. Any step which hastens the process, as would a proposal to join the Community as a full member, is undesirable on that account. If we are going to lose the preferences it would seem better to attempt to extract the most we and the rest of the Commonwealth can in the way of reciprocal tariff cuts by all other countries, and not only by those in the Community.

So far I have considered the effects of our joining the Community on our trade and that of the Commonwealth. There are sufficient disadvantages here alone to give us pause. But there are further difficulties which I can only mention briefly. Our trading partners in the European Free Trade Area would suffer if, as seems likely, they did not join the Community with us. It is, indeed, difficult to see how we could reconcile such a step with our undertakings to them. Our political relations with them would thus be

¹ It has been estimated that in 1948 about half our exports to the Commonwealth (plus the Republic of Ireland) enjoyed a preference margin, and that on these goods the preference margin was 14 per cent. By 1953 this average margin may have fallen to about 12 per cent (see Sir Donald MacDougall and R. Hutt, 'Imperial Preference: A Quantitative Analysis', *The Economic Journal*, Vol. LXIV, 1954, pp. 237 and 256). In 1958, 49 per cent of the United Kingdom's total exports went to the Commonwealth (plus the Republic of Ireland) and only 13 per cent to the Community. I have no estimate of the average level of tariffs on our exports to the Community, but it is probably of the order of 15 to 25 per cent. Hence one may compare the Imperial Preference margin of about 12 per cent, or perhaps rather less, on about 25 per cent of our total exports, with tariffs of 15 to 25 per cent on 13 per cent of our total exports, and these seem to be of about equal importance. On the other hand, if our exports to the Community continue to grow faster than our exports to the Commonwealth, the relative importance of Imperial Preference will certainly dwindle.

strained. Our relations with the Commonwealth might also suffer, both because of the reversal of Imperial Preference and because the flow of investment from us to them might be reduced. Although our balance of payments might be improved, it would be largely at their expense. Finally, there are the various provisions in the Treaty of Rome which affect what most people in this country would probably regard as matters for internal policy, and which we should be reluctant to accept.¹ There seems to be a fairly substantial body of opinion within the Community which regards the Treaty of Rome as a stepping-stone to federation. I doubt whether those in favour of federation with the Community in this country are nearly as numerous, or command much support.

The Palmerston Proposals

The proposals made at the Palmerston conference in 1959, summarised on p. 28 above, meet some of the objections raised in the preceding section. In particular, it was proposed that United Kingdom imports of food from the Commonwealth should continue to enter duty-free. The members of the Community would presumably want to restrict their imports of food from the United Kingdom, since otherwise their policies for supporting food prices at higher than world market levels might be undermined by a flood of cheap imports coming in from the Commonwealth *via* the United Kingdom. This should be practicable; even if all exports of foodstuffs and tobacco from the United Kingdom to the Community were prohibited, we would lose only about 1 per cent of our exports, and less drastic measures might suffice. The problem is much easier to solve than that which arose over industrial raw materials and semi-manufactures in the course of the Free Trade negotiations. What is more uncertain is the attitude which the members of the Community would take to our agricultural support policies, and how far they would expect to increase their exports of food to us.

The proposal was also made that the other Commonwealth countries should negotiate freer entry for their exports to the Community in exchange for the elimination of Imperial Preference. An advantage which might be secured by negotiating *en bloc* is that it would help some members of the Commonwealth (e.g. Ghana) whose individual bargaining position is weak, whether because they are small, or because they already give no substantial preferences to United Kingdom exports. If the outer members of the Commonwealth were to negotiate individually, probably only Australia, Canada, New Zealand and the Federation of Rhodesia and Nyasaland could hope to secure much advantage. This proposal might accord with the Report by a panel of experts to the G.A.T.T. Contracting Parties, which recommended 'that there should be some gradual moderation of the degree of agricultural protection in exporting and importing countries'.² On the other

¹ For example, the provisions for equal pay for equal work by men and women, and the potentially very wide provisions for the 'approximation of laws' in Article 101 of the Treaty.

² *Op cit.*, p. 102, para. 282.

hand, it is doubtful whether the members of the Community would regard it as an inducement to them to let the *United Kingdom* join. They might regard the benefit to their exports to the rest of the Commonwealth as merely the *quid pro quo* for the freer entry of imports from there. The United Kingdom's proposal to join would thus have to be considered on its own merits.

There are many questions about the second proposal which need to be answered. Should the Commonwealth lower their tariffs on imports only from the Community or on a most-favoured-nation basis? The first would mean the creation of new preferences, and so would require a waiver in the G.A.T.T. It might be resisted by the United States. On the other hand, if tariffs are to be reduced all round, it would seem desirable to seek reciprocal concessions all round—from the United States, for example. The exact nature of the concessions which the Commonwealth countries should request for their exports to the Community also has to be determined. It may be difficult to reconcile them either with the provisions for non-discrimination in the G.A.T.T. or with the Commission for the Common Market's proposals for agricultural policy.

Several of the objections which apply to the United Kingdom's becoming a full member of the Community also apply to the Palmerston proposals. There are the objections to imposing tariffs on our imports of certain raw materials and most manufactures from the Commonwealth. There is the question of our obligations to the other members of the European Free Trade Area. Finally, there are difficulties over internal economic and social policies and the possible evolution of a European Federation. It is by no means evident that these disadvantages, plus the concessions on our imports from the Community, would be outweighed by the gains on our exports to the Community. At all events, the balance of advantage seems sufficiently doubtful to make one want to consider alternatives.

World-wide tariff reductions

A large part of the United Kingdom's objective in the Free Trade Area negotiations could be secured if the Community was prepared to cut its external tariffs on manufactured goods substantially in return for similar cuts by other countries. It would in this way be possible to increase trade between this country and Europe, and to avoid substantial discrimination against our goods in the Common Market. In so far as the substantial gains in productive efficiency which flow from the creation of a Common Market are the result of the keener competition produced by freeing trade, they should also be realised, as should the possibly smaller gains from greater international specialisation and division of labour. The other members of the Commonwealth would also benefit. The elimination of Imperial Preference might be offered in return for reduced agricultural protectionism by the industrialised countries, including the United States as well as the Community.

Many of the objections to the previous proposals would be avoided. We should not have to impose tariffs on Commonwealth goods which enter

duty-free at present. We should not have to go back on our undertakings to the other members of the European Free Trade Area. We should have a freer hand in shaping our internal economic and social policies, and would not be placed in such a way as to obstruct or be in danger of ourselves being involved in the formation of a European Federation.

This approach has its own difficulties, however. Countries in Western Europe may be reluctant to make reductions in their tariffs world-wide since they fear a flood of cheap imports from Hong Kong, India, Japan and other low-wage manufacturing countries. Intra-European tariff reductions on manufactured goods may be practical politics, but not world-wide reductions. The proposals put forward by A. C. L. Day¹ might meet this objection to some extent. He suggests that the North Atlantic countries (Western Europe, Canada and the United States) should agree on world-wide reductions on advanced manufactured goods which are principally manufactured in that area. This would be consistent with the non-discrimination provisions of the G.A.T.T., and would meet with less resistance from protectionist lobbies. If a list of such goods could be devised, this proposal might well be to the advantage of the United Kingdom and Canada, though it would be of little benefit to other Commonwealth countries.

Another brake on world-wide tariff reductions may be the attitude of France, and possibly other members of the Community, who may feel that they cannot tolerate free trade, or even much freer trade than at present, unless it is coupled with at least that degree of integration between the economic policies of the countries concerned that is provided in the Treaty of Rome. Unless they have some say in the nature of the competition to which their industries are to be exposed, they will not be willing to forgo all recourse to tariffs. The United States might also find it politically difficult to make further substantial cuts in her tariffs.

It may be possible to overcome some of these difficulties by means of a complaints procedure, for example, which would enable countries whose industries were suffering particularly severely from foreign competition to obtain some relief, either by action on the part of the foreign competitor or by defensive measures themselves which would not invoke retaliation. Experience has shown that exporting countries (e.g. Japan) are keenly aware of the danger to their own exports in the long-run of too rapid expansion in the short run and they are often willing to take appropriate action.

But it must be said that a readjustment of trade patterns in the long-run is one of the objectives of freeing trade. Perhaps the best way in which the richer industrialised countries could help the poorer countries in Asia would be by opening their markets for manufactured goods, and by encouraging similar moves on the part of Australia, New Zealand and South Africa. The food exporters of the Commonwealth would also be helped by this move, since the rise in the exports and incomes of Hong Kong, India, Japan, Singapore and others would lead to a rise in their demand for imports of food and

¹ See 'New Paths to Free Trade', *The Observer*, Dec. 6th, 1959.

also of raw materials which these countries supply. In addition, the Commonwealth food exporters would be able to buy their manufactures more cheaply. The United Kingdom would probably lose, since her exports would be exposed to more severe competition, her imports of manufactures would tend to increase, and her terms of trade would be worsened. Her main economic gain would be the reduced need for aid, but there might be important political advantages in a more prosperous and expanding Commonwealth.

If attempts on these lines fail,¹ there seems to be a case for revising the G.A.T.T. so as to allow countries to make mutual tariff concessions with a 'pluralistic clause'. This would allow any other countries to benefit from these concessions provided they made concessions of approximately equal value, but unless they did so the benefits would not be extended to them. In this way countries with a strong desire to reduce tariffs would be less hampered by the laggards, and the latter would be given a sharper incentive to make concessions than under present arrangements. This proposal also has its difficulties—not the least being the complexity of tariff schedules to which it might lead. But it seems worth considering. The speed with which a programme of tariff reductions was negotiated among the Seven shows what can be done if the political will is there.

Summary

The main direct effect of the formation of the Common Market on the Commonwealth is likely to be on its trade. Particular flows of trade may be changed by large proportionate amounts, especially trade in food, beverages, tobacco and manufactures. Trade in raw materials and petroleum should not be much changed. Some countries whose exports of foodstuffs are particularly vulnerable to the agricultural policies pursued within the Community are Ghana, British East Africa, Canada, Nigeria and the Union of South Africa. The United Kingdom's exports of manufactures are also vulnerable as, to a less important extent, are those of Canada, India and Hong Kong. There are many other Commonwealth countries whose exports of food and manufactures to the Community are so small that the effects on their trade will probably be negligible. To some extent losses of exports to the Community will be compensated by gains elsewhere, but the net exporters of food may lose (and the net importers gain) if world food prices are forced downwards by the Community's agricultural policy.

If the Community's imports were to continue to grow as fast in relation to world trade as in recent years, the proportion of Commonwealth countries' total exports which consisted of food and manufactures going to the Community might double in twenty years. Past experience suggests, however,

¹ Neither the outcome of the Free Trade Area negotiations in which complaints procedures were advocated but often rejected as inadequate by the members of the Community, nor the reported response of the Community to the E.F.T.A.'s recent proposals for an all-round tariff cut of 20 per cent in July, are particularly encouraging. On the other hand, the Common Market Commission has also proposed that the eventual external tariff of the Community should be cut by 20 per cent.

that the recent rapid growth in the Community's imports is exceptional, and it may not persist. Another likely change in the future is the growing industrialisation of some Commonwealth countries, which will make the Community's external tariff on manufactures of growing importance for their exports, and may also make them lose less and gain more from agricultural protectionism on the part of the Community.

The formation of the Common Market is likely to improve its members' balance of payments with the outside world, and may reduce the outflow of capital from them. Depending on the initial state of the balance of payments upon which this improvement is superimposed, the effect could be beneficial or adverse.

While adverse effects on the Commonwealth's balance of payments might, in some circumstances, lead to deflationary policies which could seriously reduce incomes, the other effects of the formation of the Common Market on the average real income of the Commonwealth should be small, despite the possibly large effects on trade.

There seems little to be said in favour of, and much to be said against, the United Kingdom joining the Community on the same terms as its present members. Any substantial gains in productive efficiency which they are likely to obtain from freeing their mutual trade are more likely to be due to the keener competition which this produces than to greater international division of labour or improvement in their terms of trade. The United Kingdom could make similar gains by stronger policies against restrictive practices and by tariff reductions made outside the Community. A serious objection to the United Kingdom joining the Community is that this would mean putting tariffs and other restrictions on imports of food which would raise food prices and harm the exports of other members of the Commonwealth. Less importantly, their exports of some raw materials and manufactures to us would also suffer. This would hasten the end of Imperial Preference, and the adverse effects on our exports to the Commonwealth would be of the same order of magnitude as the benefits we should get by free entry into the Common Market. In addition, we should probably have to go back on our undertakings to the other members of the European Free Trade Area. The Community is regarded by an important section of opinion within it as a stepping stone to European Federation, but we would probably want to oppose such a development.

The proposals made at the Palmerston Conference remove some of these objections. It should be possible for imports of food from the Commonwealth to continue to enter the United Kingdom duty-free. The abandonment of Imperial Preference might be traded for freer entry by the rest of the Commonwealth into the Common Market. But the other objections remain.

If the Community could be persuaded to reduce its external tariffs on a world-wide basis in exchange for tariff reductions by other countries, including the abandonment of Imperial Preference, the main part of the United Kingdom's objective in the original Free Trade Area negotiations would be

secured, and the primary producers of the Commonwealth would also benefit. Since the tariff cuts would be more widely spread, including the United States for example, the potential gains would be larger than under the other proposals just considered. This proposal would not conflict with our obligations to the European Free Trade Area and would not involve us in a European Federation. But the members of the Community may be reluctant to cut their external tariffs, either through fear of low-cost competition from Asia, or because they would not have the safeguards provided by the Treaty of Rome. Most of the Commonwealth would probably benefit from such tariff cuts, though the United Kingdom might not, except politically. The present non-discriminatory provisions of the G.A.T.T. tend to slow down the pace of tariff reductions within its framework. The pace might be speeded up if countries were permitted to make mutual tariff cuts which were only passed on to others if they were willing to make concessions of equal value.

APPENDIX ON STATISTICAL SOURCES AND METHODS

Tables I and III. The data for these tables came chiefly from *Commodity Trade Statistics, January–December, 1958*, United Nations Statistical papers Series D, Vol. VIII, No. 4. This gives a commodity and area analysis of the exports of Canada, Trinidad and Tobago, the United Kingdom, Malaya and Singapore, Australia, New Zealand, Ghana, British East Africa and Nigeria. The estimates in the tables for the Union of South Africa, Hong Kong, India, the Federation of Rhodesia and Nyasaland and Pakistan were partly derived from the same source by taking the *imports* from these countries of the members of the Community and the United Kingdom. These were expressed as percentages of the total imports of all commodities of the Community and the United Kingdom from these countries, and finally as percentages of their total *exports* of all commodities to all areas. For the last step it was necessary to have figures of the total *exports* of all commodities of these countries to the world, the Community and the United Kingdom. These were obtained from *Direction of International Trade, Annual Issue, 1938, 1948 and 1955–58*, United Nations Statistical Papers Series T, Vol. X, No. 8. For a description of the commodities included in ‘foodstuffs’ and ‘manufactures’ see the note to Table I, p. 5. The estimates for the Union of South Africa’s exports to the United Kingdom in Table III, p. 14, are particularly uncertain since United Kingdom import statistics exclude diamonds which are included in the Union’s export statistics. Ghana’s exports of manufactures, excluding gems, to the United Kingdom are also uncertain, since the source quoted above does not analyse Ghana’s exports of gems by country of destination.

Table II. The estimates in Table II were obtained by linking together estimates of the current value of total imports of the members of the European Economic Community and of the rest of the world obtained from the sources described below. In each case the ‘world’ is defined as in the source quoted,

and the estimates for imports of the 'rest of the world' were obtained by subtracting from 'world' imports those of the members of the E.E.C., also defined territorially as in the sources quoted.

<i>Period</i>	<i>Source</i>
1950, 1953-58	<i>International Financial Statistics</i> , International Monetary Fund, February, 1960.
1913, 1928, 1938, 1950	Ingvar Svennilson, <i>Growth and Stagnation in the European Economy</i> , United Nations Economic Commission for Europe, Geneva, 1954, pp. 173 and 300.
1886-90, 1901-05, 1913	<i>Industrialisation and Foreign Trade</i> , League of Nations, 1945, Annex. B.

RE-ESTIMATION OF THE ECONOMETRIC MODEL OF THE U.K. AND FORECASTS FOR 1961

By L. R. KLEIN, A. HAZLEWOOD and P. VANDOME

The system of equations published in early 1959 was a first attempt at large scale estimation of an econometric model of the U.K.¹ As we indicated then, a detailed explanation of the system, covering its development and logical structure, was being written. That volume is now being printed.² Meanwhile, research work on the model has continued, and a second attempt has been made to apply it to problems of forecasting. For this purpose the equations have been re-estimated, and the major changes in them are discussed below. There has been no attempt substantially to modify the form of the equations; the changes in the estimates are the result mainly of the extension of the sample period to include eight additional quarters.

In the two years since that first application and brief discussion of the model the data have been revised and extended through 1958. The whole system of equations was re-estimated for the quarterly periods 1948-58. The basic series have also been extended through 1959 and early 1960 in order to use the model in forecasting.

We use a simplified version of the earlier notation. The newly estimated system of equations together with the list of variables follows.

THE QUARTERLY MODEL

Variables

P	Index of industrial production.
P_f	Index of production of food, drink and tobacco manufactures.
P_{eb}	Index of production of metals, engineering and vehicles, and building and contracting industries.
P_o	Index of other industrial production.
C_f	Consumption of food, drink and tobacco at constant prices.
C_d	Consumption of durable goods at constant prices.
C_o	Consumption of other goods at constant prices.
C_s	Consumption of services at constant prices.
p	Price index of total consumption.
p_f	Price index of food, drink and tobacco.
p_d	Price index of consumer durable goods.
p_o	Price index of other consumer goods.
p_s	Price index of services.
p_h	Price index of fixed assets.

¹ BULLETIN, Vol. 21, February 1959, pp. 3-16. A paper describing the model was read to the British Association for the Advancement of Science at its Cardiff meeting in September 1960, and has been published in *The Bankers' Magazine*, October 1960.

² L. R. Klein & others, *An Econometric Model of the United Kingdom*, (Oxford: Basil Blackwell), to be published.

E_t	Total civilian labour force.
E	Total in civil employment.
E_p	Total in industrial employment.
E_g	Total in civilian government employment.
$(E-E_p-E_g)$	Total in other civil employment.
U	Total unemployment.
h	Hours worked per week.
w_t	Index of weekly wage rates.
w_s	Average weekly wage earnings.
W	Wage and salary income in current prices.
D	Index of gross company profits.
T_w	Tax rate on income from employment.
T_d	Tax rate on non-employment income.
T_d'	Tax rate on company profits.
T_i	Rate of net indirect taxation.
S_u	Subsidies on agriculture and food.
G_k	Real capital formation by public authorities.
G_s	Real expenditure on current goods and services by public authorities.
M	Quarterly average holdings of liquid assets.
r	Index of yield of debentures.
r_b	Bank rate.
S_d	End-of-quarter stocks of durable materials relative to volume of production.
S_m	End-of-quarter stocks of imported materials relative to volume of imports.
I	Index of volume of total imports.
I_f	Index of volume of food, drink and tobacco imports.
I_m	Index of volume of basic materials imports.
I_o	Index of volume of manufactured and mainly manufactured imports.
X	Index of volume of total exports.
X_f	Index of volume of food, drink and tobacco exports.
X_e	Index of volume of metals and engineering products exported.
X_o	Index of volume of other goods exported.
X_s	Value of exports to the dollar area deflated by price index of total exports.
X_{er}	Value of exports to O.E.E.C. countries deflated by price index of total exports.
X_t	Value of exports to sterling area deflated by price index of total exports.
p_i	Price index of total imports.
p_{if}	Price index of food, drink and tobacco imports.
p_{im}	Price index of basic materials imported.
p_{met}	Price index of imported non-ferrous metals.

p_x	Price index of total exports.
p_{xf}	Price index of food, drink and tobacco exports.
$P_{\S}$	Index of industrial production in the dollar area.
P_{ec}	Index of industrial production in O.E.E.C. countries.
P_L	Production, employment, or exports (deflated by price index of U.K. exports) of the sterling area.
$p_{\S}$	Index of domestic prices of manufactured goods in the dollar area.
p_{wf}	Index of world domestic food prices.
p_{xc}	Index of export prices of competing countries.
B_L	End-of-quarter sterling balances of the sterling area.
R	End-of-quarter gold and dollar reserves as proportion of U.K. imports.
P_{wf}	World production (weighted by U.K. food exports).
P_{we}	World production (weighted by U. K. engineering exports).
F	Political factor in wage bargaining = 0 before 1st January, 1952. = 1 after 1st January, 1952.
Z	Food de-rationing factor = 1 in 1954 and 1955. = 0 in all other periods.
t	Time measured in quarter units (101 in 1st quarter 1948, 102 in 2nd quarter 1948, etc.)
Q_i	Quarterly seasonal indicator = 1 in i th quarter. = 0 otherwise.

Estimated Equations

The coefficients have been estimated, in the main, by the method of limited information maximum likelihood with quarterly observations for the period 1948–59. In equations (2)–(4), (8)–(17), which contain only one unlagged endogenous variable, the estimates are equivalent to those obtained by the conventional least squares method. Satisfactory estimates could not be obtained for equations (19) and (29) using the limited information method, and a similar method, giving two-stage least squares estimates, was used.¹ A restricted sample period was used in estimating two equations. The period before 1952 was omitted for equation (3), and the abnormal period due to the Korean war, 1951 quarter (ii) to 1952 quarter (i), was omitted for equation (14).

In the numerical equations most of the variables are index numbers scaled to average 100 in the four quarters of 1948. Current variables are denoted by the subscript t , variables lagged one quarter by the subscript $t-1$, etc. The variables which are not index numbers are F , Z , t and the quarterly indicators

¹ The two-stage least squares method is also known as 'Theil's two-rounds method.' It is described and compared with the limited information method by L. R. Klein, 'On the Interpretation of Theil's Method of Estimating Economic Relationships', *Metroeconomica*, Vol. 7, 1955, pp. 147–53. See also H. Theil, *Economic Forecasts and Policy* (Amsterdam: North Holland Publishing Co., 1958).

Q_1 , Q_2 , and Q_3 . Estimated sampling errors are in parentheses under the coefficients. The goodness-of-fit statistic R^2 is adjusted for degrees of freedom and is given by

$$R^2 = 1 - \frac{\text{variance of residuals in equation}}{\text{variance of variable on left-hand-side}}$$

The serial correlation measure, δ^2/s^2 , is the ratio of mean square successive difference of the residuals to the variance of the residuals. Acceptance of the hypothesis of non-autocorrelated residuals at the 5 per cent significance level requires values in the range 1.5—2.6 for samples of 48 observations.

The same numbering of the equations is used as in the previous forecast. Since exports to the independent and dependent parts of the sterling area are no longer distinguished there is no equation (15) in the present form of the model.

$$(1) P_t = \underset{(7.34)}{-62.96} + \underset{(0.04)}{1.047}[(hE_p)_t + \underset{(1.41)}{0.6I_t}] - \underset{(1.41)}{0.65}Q_1 - \underset{(1.40)}{3.58}Q_2 - \underset{(1.41)}{10.24}Q_3$$

$$R^2 = 0.94 \quad \delta^2/s^2 = 1.43$$

$$(2) (P_f)_t = \underset{(17.42)}{-5.37} + \underset{(0.21)}{0.999}(C_f)_{t-1} + \underset{(0.06)}{0.083}(X_f)_{t-1} - \underset{(1.95)}{11.91}Q_1 + \underset{(2.88)}{10.50}Q_2 - \underset{(2.09)}{2.07}Q_3$$

$$R^2 = 0.84 \quad \delta^2/s^2 = 1.88$$

$$(3) (P_{ab})_t = \underset{(12.62)}{59.34} + \underset{(0.08)}{0.212}(G_a)_{t-1} + \underset{(0.10)}{0.112}(X_a)_{t-1} + \underset{(0.063)}{0.138}(C_d)_{t-1}$$

$$+ \underset{(0.09)}{0.226}\left(\frac{D}{p_d} \cdot \frac{1}{T_d}\right)_{t-1} - \underset{(0.045)}{0.098}r_{t-4} - \underset{(2.39)}{5.66}Q_1 - \underset{(2.17)}{4.86}Q_2 - \underset{(1.88)}{16.17}Q_3$$

$$R^2 = 0.95 \quad \delta^2/s^2 = 1.86$$

(Data from 1952(i) onwards)

$$(4) (P_o)_t = \underset{(5.18)}{30.04} + \underset{(0.07)}{0.203}(C_o)_{t-1} + \underset{(0.05)}{0.351}(X_o)_{t-1} + \underset{(0.04)}{0.228}(G_s)_{t-1}$$

$$- \underset{(1.95)}{4.52}Q_1 - \underset{(1.31)}{5.91}Q_2 - \underset{(1.34)}{11.76}Q_3$$

$$R^2 = 0.92 \quad \delta^2/s^2 = 1.84$$

$$(5) (C_f)_t = \underset{(6.70)}{8.72} + \underset{(0.04)}{0.119}\left(\frac{W}{p_f} \cdot \frac{1}{T_w}\right)_t + \underset{(0.023)}{0.048}\left(\frac{D}{p_f} \cdot \frac{1}{T_d}\right)_t$$

$$+ \underset{(0.10)}{0.804}\left[\frac{(C_f)_{t-1} + \dots + (C_f)_{t-8}}{8}\right] - \underset{(0.89)}{11.69}Q_1 - \underset{(0.90)}{7.10}Q_2 - \underset{(0.90)}{1.87}Q_3$$

$$R^2 = 0.95 \quad \delta^2/s^2 = 1.75$$

$$(6) (C_d)_t = \underset{(23.11)}{-93.23} + \underset{(0.23)}{1.258}\left(\frac{W}{p_d} \cdot \frac{1}{T_w}\right)_t + \underset{(0.21)}{0.849}\left(\frac{D}{p_d} \cdot \frac{1}{T_d}\right)_t$$

$$- \underset{(8.54)}{8.45}Q_1 - \underset{(8.29)}{8.14}Q_2 - \underset{(8.37)}{10.62}Q_3$$

$$R^2 = 0.73 \quad \delta^2/s^2 = 0.74$$

$$(7) (C_o)_t = 15.44 + 0.192 \left(\frac{W}{p_o} \cdot \frac{1}{T_w} \right)_t + 0.103 \left(\frac{D}{p_o} \cdot \frac{1}{T_d} \right)_t \\ (7.73) \quad (0.06) \quad (0.051) \\ + 0.698 \left[\frac{(C_o)_{t-1} + \dots + (C_o)_{t-8}}{8} \right] - 20.98 Q_1 - 15.68 Q_2 - 20.62 Q_3 \\ (0.13) \quad (1.90) \quad (1.83) \quad (1.87) \\ R^2 = 0.93 \quad \delta^2/s^2 = 1.36$$

$$(8) (C_s)_t = 20.37 + 0.692(C_s)_{t-1} + 0.011(C_s)_{t-2} + 3.78 Q_1 + 14.29 Q_2 + 16.79 Q_3 \\ (8.32) \quad (0.10) \quad (0.10) \quad (1.81) \quad (1.39) \quad (0.73) \\ R^2 = 0.98 \quad \delta^2/s^2 = 2.12$$

$$(9) (I_f)_t = -43.81 + 1.363(C_f)_{t-1} + 0.033 R_{t-2} - 2.26 Q_1 + 12.32 Q_2 + 2.99 Q_3 \\ (18.44) \quad (0.15) \quad (0.03) \quad (2.92) \quad (3.31) \quad (2.85) \\ R^2 = 0.66 \quad \delta^2/s^2 = 1.17$$

$$(10) (I_m)_t = 36.89 + 0.769 P_{t-1} + 0.032 R_{t-2} - 0.128 (S_m)_{t-1} \\ (22.21) \quad (0.10) \quad (0.03) \quad (0.13) \\ - 4.86 Q_1 - 3.82 Q_2 - 3.62 Q_3 \\ (3.24) \quad (3.01) \quad (2.90) \\ R^2 = 0.73 \quad \delta^2/s^2 = 1.60$$

$$(11) (I_o)_t = -110.61 + 2.038 P_{t-2} + 0.056 R_{t-2} + 0.082 [(p_{met})_{t-3} - (p_{met})_{t-4}] \\ (16.74) \quad (0.12) \quad (0.05) \quad (0.15) \\ + 15.86 Q_1 - 6.91 Q_2 - 7.91 Q_3 \\ (4.68) \quad (4.42) \quad (6.77) \\ R^2 = 0.88 \quad \delta^2/s^2 = 1.53$$

$$(12) (X_s)_t = -219.98 + 2.546 (P_s)_{t-1} + 0.780 \left(\frac{p_s}{p_x} \right)_{t-1} \\ (31.40) \quad (0.15) \quad (0.26) \\ - 22.74 Q_1 - 3.83 Q_2 - 13.44 Q_3 \\ (7.04) \quad (6.65) \quad (6.62) \\ R^2 = 0.89 \quad \delta^2/s^2 = 1.26$$

$$(13) (X_{\sigma})_t = 67.92 + 0.477 (P_{\sigma})_{t-1} - 4.41 Q_1 - 6.63 Q_2 - 16.13 Q_3 \\ (7.30) \quad (0.04) \quad (4.74) \quad (4.74) \quad (4.76) \\ R^2 = 0.76 \quad \delta^2/s^2 = 0.87$$

$$(14) (X_{\ell})_t = 12.96 + 0.659 (P_{\ell})_{t-2} + 0.340 \left(\frac{B_{\ell}}{p_x} \right)_{t-2} - 0.06 Q_1 - 6.06 Q_2 - 8.97 Q_3 \\ (32.64) \quad (0.11) \quad (0.24) \quad (4.09) \quad (4.01) \quad (4.02) \\ R^2 = 0.52 \quad \delta^2/s^2 = 1.39$$

(Four quarters, 51 (ii) - 52(i), omitted)

$$(16) (X_f)_t = -75.00 + 0.899 (P_{wf})_{t-3} + 1.084 \left(\frac{p_{wf}}{p_{xf}} \right)_{t-3} \\ (30.53) \quad (0.08) \quad (0.30) \\ - 13.83 Q_1 - 14.40 Q_2 - 21.07 Q_3 \\ (4.88) \quad (4.84) \quad (4.84) \\ R^2 = 0.79 \quad \delta^2/s^2 = 2.10$$

$$(17) (X_e)_t = 9.65 + 1.021(P_{we})_{t-1} - 4.86Q_1 - 5.82Q_2 - 12.82Q_3$$

$(8.25) \quad (0.06) \quad (4.37) \quad (3.59) \quad (3.42)$
 $R^2 = 0.87 \quad \delta^2/s^2 = 1.50$

$$(18) (w_r)_t - (w_r)_{t-4} = 12.50 - 0.112 \left(\frac{U_t + U_{t-1} + U_{t-2} + U_{t-3}}{4} \right)$$

$$+ 0.980 \left[\frac{(p_t - p_{t-4}) + \dots + (p_{t-3} - p_{t-7})}{4} \right] + 3.03F_t$$

$(1.74) \quad (0.02) \quad (0.13) \quad (0.64) \quad (0.64) \quad (0.64) \quad (0.50)$
 $R^2 = 0.74 \quad \delta^2/s^2 = 1.05$

$$(19) (w_e)_t - (w_r)_t = -115.71 + 0.340h_t + 0.783 \left(\frac{P}{hE_p} \right)_t$$

$$- 0.73Q_1 + 1.73Q_2 + 7.08Q_3$$

$(46.99) \quad (0.53) \quad (0.07) \quad (0.87) \quad (0.89) \quad (1.11)$
 $R^2 = 0.90 \quad \delta^2/s^2 = 1.02$

$$(20) p_t = 35.85 + 0.410(w_e)_t + 0.172(p_i)_{t-2} + 0.057(T_i)_t$$

$$+ 0.23Q_1 + 1.39Q_2 + 0.71Q_3$$

$(4.40) \quad (0.008) \quad (0.02) \quad (0.57) \quad (0.49) \quad (0.49)$
 $R^2 = 0.99 \quad \delta^2/s^2 = 0.90$

$$(21) h_t = 93.08 + 0.070P_t - 0.11Q_1 + 0.19Q_2 + 0.69Q_3$$

$(0.88) \quad (0.007) \quad (0.25) \quad (0.25) \quad (0.26)$
 $R^2 = 0.71 \quad \delta^2/s^2 = 0.61$

$$(22) (p_i)_t = 4.53 + 0.985p_t - 0.038(S_u)_t + 1.58Z_t - 0.41Q_1 + 0.98Q_2 + 0.31Q_3$$

$(4.98) \quad (0.03) \quad (0.025) \quad (0.49) \quad (0.49) \quad (0.49) \quad (0.49)$
 $R^2 = 0.99 \quad \delta^2/s^2 = 0.54$

$$(23) (p_d)_t = 31.52 + 0.677p_t + 0.077(p_{mat})_{t-2} - 0.057(S_d)_{t-1}$$

$$+ 0.98Q_1 - 0.97Q_2 - 0.54Q_3$$

$(4.15) \quad (0.08) \quad (0.03) \quad (0.040) \quad (1.25) \quad (1.38) \quad (1.35)$
 $R^2 = 0.94 \quad \delta^2/s^2 = 0.38$

$$(24) (p_o)_t = 29.28 + 0.639p_t + 0.068(p_{im})_{t-2} + 0.49Q_1 - 0.78Q_2 + 0.15Q_3$$

$(1.44) \quad (0.01) \quad (0.007) \quad (0.45) \quad (0.45) \quad (0.45)$
 $R^2 = 0.99 \quad \delta^2/s^2 = 0.67$

$$(25) (p_k)_t = 48.20 + 0.600(w_e)_t + 0.042(p_{mat})_{t-2} - 0.106(S_d)_{t-1}$$

$$- 2.26Q_1 - 2.57Q_2 - 1.10Q_3$$

$(3.50) \quad (0.03) \quad (0.019) \quad (0.04) \quad (1.02) \quad (1.11) \quad (1.10)$
 $R^2 = 0.98 \quad \delta^2/s^2 = 0.98$

$$(26) (p_x)_t = 3.53 + 0.456p_t + 0.533(p_{xc})_{t-2} + 1.14Q_1 - 0.41Q_2 - 0.09Q_3$$

(4.40) (0.06) (0.05) (1.37) (1.37) (1.36)

$$R^2 = 0.96 \quad \delta^2/s^2 = 0.63$$

$$(27) (p_x)_t = 33.98 + 0.709(p_x)_t + 0.22Q_1 + 1.37Q_2 + 1.70Q_3$$

(9.98) (0.08) (3.22) (3.21) (3.21)

$$R^2 = 0.67 \quad \delta^2/s^2 = 0.51$$

$$(28) r_t = 233.98 + 0.088(r_t)_t - 1.502 \left(\frac{M_t}{0.79W_t + 0.21D_t} \right) + 0.336(p_t - p_{t-4})$$

(30.06) (0.07) (0.26) (4.77) (4.83) (4.80) (0.79)

$$R^2 = 0.80 \quad \delta^2/s^2 = 1.55$$

$$(29) (E_t)_t = 83.47 - 0.022 \left(\frac{U_t + U_{t-1} + U_{t-2} + U_{t-3}}{4} \right) + 0.188t$$

(0.52) (0.003) 4 (0.003)

$$R^2 = 0.99 \quad \delta^2/s^2 = 0.69$$

$$(30) (E - E_p - E_g)_t = 41.78 + 0.573(E_p)_t - 0.48Q_1 + 0.38Q_2 + 1.19Q_3$$

(4.95) (0.05) (0.45) (0.45) (0.45)

$$R^2 = 0.75 \quad \delta^2/s^2 = 0.30$$

Identities and Technical Definitions:

$$(31) D_t = 4.763[8.5644 + 0.8875(pP)_{t-1}] + 3.76W_{t-1}$$

$$= 37.27 - 53.56Q_1 - 62.93Q_2 - 46.75Q_3$$

$$(32) P_t = 0.10(P_f)_t + 0.43(P_o)_t + 0.47(P_{eb})_t$$

$$(33) I_t = 0.40(I_f)_t + 0.20(I_o)_t + 0.40(I_m)_t$$

$$(34) p_t = 0.44(p_f)_t + 0.10(p_d)_t + 0.33(p_o)_t + 0.14(p_s)_t$$

$$(35) 0.04(X_f)_t + 0.50(X_e)_t + 0.46(X_o)_t = 0.06(X_g)_t + 0.40(X_{er})_t + 0.51(X_t)_t$$

$$(36) W_t = 7.58 + 0.94(w_e E)_t$$

$$(37) U_t = 18.07(E_t)_t - 17.21E_t$$

Discussion of the Estimates

The new system has the same general structure as the first. There are, however, some significant changes in the numerical estimates of the parameters, and changes have been made in the form of some of the equations. It is these changes which we propose to discuss.

We shall look first at the two estimates of the 'production decision equation' for engineering and building.

$$\begin{aligned}
 (1st \text{ est.}) (P_{eb})_t = & 57.02 + 0.18(G_k)_{t-1} + 0.056(X_e)_{t-1} \\
 & \quad (13.25) \quad (0.12) \quad (0.082) \\
 & + 0.072(C_d)_{t-1} + 0.24\left(\frac{D}{p_k} \frac{1}{T_d'}\right)_{t-1} - 0.009r_{t-4} \\
 & \quad (0.085) \quad (0.08) \quad (0.092) \\
 & - 0.87Q_1 - 3.18Q_2 - 13.32Q_3 \\
 & \quad (3.29) \quad (2.18) \quad (1.85) \\
 R^2 = & 0.94 \quad \delta^2/s^2 = 2.66
 \end{aligned}$$

$$\begin{aligned}
 (2nd \text{ est.}) (P_{eb})_t = & 59.34 + 0.21(G_k)_{t-1} + 0.11(X_e)_{t-1} \\
 & \quad (12.62) \quad (0.08) \quad (0.10) \\
 & + 0.14(C_d)_{t-1} + 0.23\left(\frac{D}{p_k} \frac{1}{T_d'}\right)_{t-1} - 0.098r_{t-4} \\
 & \quad (0.06) \quad (0.09) \quad (0.045) \\
 & - 5.66Q_1 - 4.86Q_2 - 16.17Q_3 \\
 & \quad (2.39) \quad (2.17) \quad (1.88) \\
 R^2 = & 0.95 \quad \delta^2/s^2 = 1.86
 \end{aligned}$$

In both equations, the sample period begins with the first quarter of 1952. In view of the size of the estimated sampling errors most coefficients have not changed significantly. The goodness-of-fit is the same and both equations have residuals that are free of first order serial correlation. We note, however, a sizeable change (tenfold) in the coefficient of r , the debenture yield. Empirical research into the effect of interest rates on investment have been singularly inconclusive for many years. Many of the past studies are drawn from samples in which interest rates fluctuated in a narrow margin. It is noteworthy that the extension of our sample period to include 1957-58, when there was vigorous use of monetary policy, yields a statistically significant effect. Although the effect is significant in a statistical sense, it does not suggest that the interest elasticity is large. In many past studies, it was concluded that the elasticity was small, although all one could justifiably have deduced from the results obtained was that the outcome was in doubt. The sampling errors were large and the elasticity could have been zero or fairly large. This was also true of our first estimate. In our new estimate the coefficient is statistically significant but not significantly larger than the old estimate, given the size of the sampling errors.

The inconclusive nature of the interest effect on investment has been found in Western economies. Japanese data now being analyzed at the Institute for Social and Economic Research of Osaka University suggest stronger and more precise interest effects on investment. These findings are interesting in the present context because rates are generally higher in Japan than in the Western World, and fluctuate by larger amounts.

Consumption is analyzed by four categories in our model—food, durables, non-durable goods (exclusive of food), and services. For each category we originally postulated the same type of function, with wage income, non-wage or profit income, and average consumption of the past eight quarters as explanatory variables. In each equation the two types of income are deflated

by the price index of the particular consumption category and by the appropriate tax rate. Naturally, there tends to be some intercorrelation between the two types of income and this dependence will vary from equation to equation, depending on the deflators used. Moreover, the overall fit of each equation will affect the extent to which intercorrelation interferes with the separate allocation of marginal contributions to each income variable. With the new sample we have obtained better estimates of the separate income effects in the equations for food, durables, and other non-durable goods. Previously, we had to drop the profit term from the food equation because of the complications of intercorrelation. We now have significant results for both income effects in each of these three equations, and in every case the marginal wage coefficient exceeds the marginal profit coefficient, as we should expect on *a priori* grounds.

In the durables consumption equation, we formerly had a negative coefficient for lagged consumption of durables. This term is a moving average of past consumption. If this average were to be extended to a length of 10-15 years, which is impracticable in our sample, it would represent essentially the stock of durables and might be expected to have a negative coefficient. For our shorter lag, the sign of this coefficient is more uncertain. Our results for the two types of income are firmer when the lag term is omitted than when it is included. We have decided to omit the lag altogether in our new estimate, but the overall correlation has dropped considerably. This is not necessarily a worse result because it has long been felt that durables demand is more widely fluctuating than other types of consumer demand and ought, structurally, to have a relatively large unexplained variance. We find the same result for quarterly statistics of the American economy over approximately the same sample period.

$$\begin{aligned} \text{(1st est.) } (C_f)_t = & 33.90 + 0.24 \left(\frac{W}{p_f} \frac{1}{T_w} \right)_t + 0.49 \left[\frac{(C_f)_{t-1} + \dots + (C_f)_{t-8}}{8} \right] \\ & \begin{matrix} (18.16) & (0.08) & & (0.25) \end{matrix} \\ & -11.92Q_1 - 7.21Q_2 - 1.25Q_3 \\ & \begin{matrix} (0.89) & (0.91) & (0.89) \end{matrix} \\ & R^2 = 0.92 \quad \delta^2/s^2 = 1.56 \end{aligned}$$

$$\begin{aligned} \text{(2nd est.) } (C_f)_t = & 8.72 + 0.12 \left(\frac{W}{p_f} \frac{1}{T_w} \right)_t + 0.048 \left(\frac{D}{p_f} \frac{1}{T_d} \right)_t \\ & \begin{matrix} (6.70) & (0.04) & & (0.023) \end{matrix} \\ & + 0.80 \left[\frac{(C_f)_{t-1} + \dots + (C_f)_{t-8}}{8} \right] - 11.69Q_1 - 7.10Q_2 - 1.87Q_3 \\ & \begin{matrix} (0.10) & & (0.89) & (0.90) & (0.90) \end{matrix} \\ & R^2 = 0.95 \quad \delta^2/s^2 = 1.75 \end{aligned}$$

$$\begin{aligned} \text{(1st est.) } (C_d)_t = & -59.10 + 1.49 \left(\frac{W}{p_d} \frac{1}{T_w} \right)_t + 0.57 \left(\frac{D}{p_d} \frac{1}{T_d} \right)_t \\ & \begin{matrix} (16.15) & (0.21) & & (0.15) \end{matrix} \\ & - 0.23 \left[\frac{(C_d)_{t-1} + \dots + (C_d)_{t-8}}{8} \right] - 12.62Q_1 - 16.67Q_2 - 17.05Q_3 \\ & \begin{matrix} (0.18) & & (5.20) & (5.08) & (5.03) \end{matrix} \\ & R^2 = 0.88 \quad \delta^2/s^2 = 1.16 \end{aligned}$$

$$\begin{aligned}
 (2\text{nd est.}) (C_d)_t = & \underset{(23.11)}{-93.23} + \underset{(0.23)}{1.26} \left(\frac{W}{p_d} \frac{I}{T_w} \right)_t + \underset{(0.21)}{0.85} \left(\frac{D}{p_d} \frac{I}{T_d} \right)_t \\
 & \underset{(8.54)}{-8.45Q_1} \underset{(8.29)}{-8.14Q_2} \underset{(8.37)}{-10.62Q_3} \\
 R^2 = & 0.73 \quad \delta^2/s^2 = 0.74
 \end{aligned}$$

$$\begin{aligned}
 (1\text{st est.}) (C_o)_t = & \underset{(21.71)}{28.96} + \underset{(0.04)}{0.15} \left(\frac{W}{p_o} \frac{I}{T_w} \right)_t + \underset{(0.047)}{0.064} \left(\frac{D}{p_o} \frac{I}{T_d} \right)_t \\
 & + \underset{(0.27)}{0.58} \left[\frac{(C_o)_{t-1} + \dots + (C_o)_{t-8}}{8} \right] \underset{(1.49)}{-15.63Q_1} \underset{(1.47)}{-9.64Q_2} \underset{(1.47)}{-10.32Q_3} \\
 R^2 = & 0.86 \quad \delta^2/s^2 = 0.94
 \end{aligned}$$

$$\begin{aligned}
 (2\text{nd est.}) (C_o)_t = & \underset{(7.73)}{15.44} + \underset{(0.06)}{0.19} \left(\frac{W}{p_o} \frac{I}{T_w} \right)_t + \underset{(0.05)}{0.10} \left(\frac{D}{p_o} \frac{I}{T_d} \right)_t \\
 & + \underset{(0.13)}{0.70} \left[\frac{(C_o)_{t-1} + \dots + (C_o)_{t-8}}{8} \right] \underset{(1.90)}{-20.98Q_1} \underset{(1.83)}{-15.68Q_2} \underset{(1.87)}{-20.62Q_3} \\
 R^2 = & 0.93 \quad \delta^2/s^2 = 1.36
 \end{aligned}$$

The equation for consumer expenditure on services has proved to be considerably more intractable than any of the three preceding consumption relationships. In the first estimate we found no relationship with any economic variable other than wage income in the services consumption equation. Using the new sample data, revised and extended in time, we could find no relationship between services consumption and wage income. This holds true for all methods of estimation and can be seen from simple graphs of joint observations of C_s and $\left(\frac{W}{p_s} \frac{I}{T_w} \right)$. Scatter diagrams look equally meaning-

less in the other income variable as well. Three makeshift possibilities afford a simple treatment of C_s for our purpose. C_s could be fixed at exogenous values; it could be estimated from a simple trend; or it could be estimated from a purely autoregressive equation. We have chosen the last method, as can be seen above in the list of estimated equations. This provides no basic explanation of C_s ; it merely gives us an empirical relation with high correlation.

The next change deserving comment occurs in the equation for exports to the sterling area. Formerly we estimated two separate equations, one for the independent and one for the dependent sterling area. These classifications are gradually losing their meaning, and definitions of the two areas are rapidly changing. As countries change in status from *dependent* to *independent* the distinction between the two areas is losing its economic meaning. And it is becoming increasingly difficult to construct series for the areas as originally defined. In making the first estimates we had to introduce a 'dummy' variable, $\mathcal{J}$, to account for the changing status of countries. The variable disappears now that the distinction between the two parts of the sterling area is no longer made. The old and new estimates are

(1st est.) (independent sterling area)

$$(X_{\ell i})_t = \underset{(49.83)}{-31.30} + \underset{(0.34)}{0.90}(P_{\ell i})_{t-2} + \underset{(0.20)}{0.55}\left(\frac{B_{\ell i}}{P_x}\right)_{t-2} + \underset{(5.54)}{16.50} \mathcal{Y}_t \\ + \underset{(5.33)}{2.69} Q_1 - \underset{(5.32)}{6.52} Q_2 - \underset{(5.50)}{8.62} Q_3 \\ R^2 = 0.41 \quad \delta^2/s^2 = 1.26$$

(1st est.) (dependent sterling area)

$$(X_{\ell d})_t = \underset{(16.39)}{27.42} + \underset{(0.14)}{0.19}(P_{\ell d})_{t-3} + \underset{(0.23)}{0.74}\left(\frac{B_{\ell d}}{P_x}\right)_{t-3} - \underset{(10.44)}{29.60} \mathcal{Y}_t \\ - \underset{(5.72)}{8.83} Q_1 - \underset{(5.83)}{15.32} Q_2 - \underset{(5.72)}{13.52} Q_3 \\ R^2 = 0.74 \quad \delta^2/s^2 = 1.85$$

$$(2nd \text{ est.}) (X_{\ell})_t = \underset{(32.64)}{12.96} + \underset{(0.11)}{0.66}(P_{\ell})_{t-2} + \underset{(0.24)}{0.34}\left(\frac{B_{\ell}}{P_x}\right)_{t-2} \\ - \underset{(4.09)}{0.06} Q_1 - \underset{(4.01)}{6.06} Q_2 - \underset{(4.02)}{8.97} Q_3 \\ R^2 = 0.52 \quad \delta^2/s^2 = 1.39$$

In the first estimates, the Korean War quarters, 1951 (ii) to 1952 (i), are omitted for the dependent sterling area countries because of the distortion of their terms of trade as a result of extreme rises in basic raw material prices. These same quarters are omitted from the sample used for estimating the equation for the combined areas. When the two areas were treated separately, we had concluded that the holding of sterling balances was a factor of some importance in determining their purchases of U.K. exports. In the new estimate the coefficient of the sterling balances term is not statistically significant. The coefficient of P_{ℓ} in the estimate for the combined area falls between the two separate coefficients in the earlier estimates.

The spread between wage earnings and rates, known as the 'wage drift', was accounted for largely in our first set of estimates, by movements in the hours variable and, to a smaller extent, by the productivity variable. This result paralleled the findings of Hansen and Rehn in Sweden, who argued that demand conditions in the labour market were more important than productivity in explaining the 'wage drift'.¹ In American discussions of demand *versus* cost inflation, labour market demand pressures have been frequently cited as a reason for high earnings. The variable measuring hours of work is usually a good indicator of general demand conditions and certainly of labour market demand.

Other studies have stressed the comparative importance of productivity in accounting for the earnings-rates spread. Lydall has argued that piece workers will find their earnings increased over standard rates if productivity

¹ B. Hansen and G. Rehn, 'On Wage-Drift. A Problem of Money-Wage Dynamics', *Economic Essays in Honour of Erik Lindahl* (Stockholm: Ekonomisk Tidskrift, 1956), pp. 87-138.

risers.¹ In a similar vein, Turner has argued that productivity alone accounts for most of the 'wage drift'.²

Estimating this equation with the new sample by the limited information method gave a negative coefficient for the hours variable. The two-stage least squares method gave a positive coefficient, and we have therefore used these results. Neither method, however, gave a value which was significantly different from zero.

In the new estimate, the coefficient of productivity remains statistically significant, and of about the same size as in the earlier estimate. The hours coefficient, on the other hand, is much smaller and statistically insignificant. Our new results appear, therefore, to lend support to the productivity explanation of wage drift. But the marked changes in the estimates with the new sample suggest that the results should be interpreted with great reserve.

(1st est.)

$$(w_e)_t - (w_r)_t = -272.72 + 2.06h_t + 0.62\left(\frac{P}{hE_p}\right)_t + 0.001Q_1 + 1.58Q_2 + 5.54Q_3$$

(45.80) (0.54) (0.15) (0.96) (0.98) (1.36)

$$R^2 = 0.86 \qquad \delta^2/s^2 = 0.73$$

(2nd est.) (two-stage least squares)

$$(w_e)_t - (w_r)_t = -115.71 + 0.34h_t + 0.78\left(\frac{P}{hE_p}\right)_t - 0.73Q_1 + 1.73Q_2 + 7.08Q_3$$

(46.99) (0.53) (0.07) (0.87) (0.89) (1.11)

$$R^2 = 0.90 \qquad \delta^2/s^2 = 1.02$$

All the price formation equations in the first set of estimates showed high serial correlation of residuals. We are now trying to re-estimate these equations in a form that will not have such high serial correlation; nevertheless, all the estimates used for the new forecast are equally unsatisfactory so far as serial correlation is concerned.

Stocks of durable goods have recently been introduced in the equations for p_d and p_k . A series on these stocks was not available at the time when the first set of price equations was estimated. Serial correlation of residuals is found in the new estimate for p_k , whereas it was absent in the original estimate.

Larger changes are evident in the two estimated equations for the formation of food price.

(1st est.)

$$(p_f)_t = 154.94 + 0.11(p_{if})_{t-2} - 0.68(S_u)_t + 3.23Z_t$$

(21.24) (0.10) (0.12) (2.04)

$$-2.52Q_1 + 1.42Q_2 + 0.40Q_3$$

(2.26) (2.20) (2.18)

$$R^2 = 0.90 \qquad \delta^2/s^2 = 0.58$$

¹ H. F. Lydall, 'Inflation and the Earnings Gap', *BULLETIN*, Vol. 20, 1958, pp. 285-304.

² H. A. Turner, 'Wages, Productivity and the Level of Employment: More on the Wage Drift', *Manchester School*, Vol. XXVIII, 1960, pp. 89-123.

(2nd est.)

$$(p_f)_t = 4.53 + 0.99p_t - 0.038(S_u)_t + 1.58Z_t - 0.41Q_1 + 0.98Q_2 + 0.31Q_3$$

$(4.98) \quad (0.03) \quad (0.025) \quad (0.49) \quad (0.49) \quad (0.49) \quad (0.49)$
 $R^2 = 0.99 \quad \delta^2/s^2 = 0.54$

Food price might be expected to be related to both the general price level and the price of imported food. We have not, in either sample, been able to find reasonable and significant estimates of both coefficients jointly. In the older estimates we used p_{if} as the relevant variable of the two, but its coefficient had a large sampling error. In the second estimate we have switched to the use of p instead of p_{if} . This variable is much more significant in a statistical sense, but it changes the coefficients of S_u and Z considerably.

In the equation relating the non-industrial to the industrial labour supply we have now omitted the unemployment variable. Formerly, it had a significant negative coefficient showing that a high demand for labour (indicated by low unemployment) induced people to enter the non-industrial labour force. This is reasonable in view of the fact that much of the variability in the labour supply is the result of changes in the number of women workers. In the new estimates we persistently obtained positive coefficients for the unemployment variable and have finally decided to omit it from the computed equation.

(1st est.)

$$(E - E_p - E_g)_t = 67.54 + 0.35(E_p)_t - 0.022 \left(\frac{U_t + \dots + U_{t-3}}{4} \right)$$

$(3.17) \quad (0.03) \quad (0.009)$
 $-0.60Q_1 + 0.23Q_2 + 0.87Q_3$
 $(0.25) \quad (0.25) \quad (0.25)$
 $R^2 = 0.90 \quad \delta^2/s^2 = 0.68$

(2nd est.)

$$(E - E_p - E_g)_t = 41.78 + 0.57(E_p)_t - 0.48Q_1 + 0.38Q_2 + 1.19Q_3$$

$(4.95) \quad (0.05) \quad (0.45) \quad (0.45) \quad (0.45)$
 $R^2 = 0.75 \quad \delta^2/s^2 = 0.30$

Although other changes occurred in the estimation of the model from the new sample data, the ones discussed above are the most striking and important. They merit specific comment. The other changes are generally no more than we could expect as a result of sampling variability.

FORECASTS FOR 1961

To use the model for predicting the values of the principal endogenous variables in the first two quarters of 1961 we have, first, modified a number of the equations. Secondly, we have inserted values of the exogenous and lagged endogenous variables; and finally we have solved the resulting set of equations.

TABLE I

Residuals in Estimated Equations

Equation	1958		1959		Adjustment to constant term
	mean	signs	mean	signs	
1	- 0.2	+ + - -	+ 0.4	- + + -	0
2	+ 0.9	- + - +	+ 3.6	- + + +	0
3	- 1.8	- - - -	- 9.5	- - - -	- 7
4	- 1.0	+ - - +	+ 2.5	- + - +	0
5	+ 1.6	+ + - +	+ 0.9	- + - +	0
6	+34.3	+ + + +	+36.2	+ + + +	+36
7	+ 3.7	+ + + +	+ 1.9	+ + - +	+ 3
8	+ 0.3	- - + +	+ 0.9	+ + + +	0
9	+ 3.9	- + + +	- 2.0	- + - +	0
10	- 5.0	- - - +	+ 1.9	- + - +	0
11	+ 6.0	+ - + +	+29.7	+ + + +	+22
12	+23.0	+ + + +	+34.4	+ + + +	0
13	-14.0	- - - -	- 4.9	- - - +	- 8
14	+ 4.1	+ - + +	- 2.4	- + - +	0
16	+ 0.6	- + + -	- 8.3	- - + +	0
17	- 0.1	- - + +	- 0.8	- + - +	0
18	+ 0.9	+ - + +	+ 6.1	+ + + +	+ 4
19	+ 0.4	- + - -	- 1.1	+ - - -	0
20	+ 1.0	+ + + +	- 1.0	+ - - -	- 1
21	- 0.9	- - - -	- 1.0	- - - -	- 1
22	- 0.4	- - - +	- 1.4	- - - -	- 1
23	+ 1.7	+ + + +	- 1.3	+ - - -	- 1
24	+ 0.7	+ + + +	+ 0.8	+ + + +	0
25	+ 2.8	+ + + +	- 4.5	- - - -	- 5
26	- 1.7	- - - -	- 2.6	- - - -	- 2
27	- 7.6	- - - -	- 6.5	- - - -	- 7
28	+ 8.1	+ + + +	+ 8.5	+ + + +	+ 8
29	+ 0.2	+ + + +	+ 0.7	+ + + +	+ 1
30	+ 1.5	+ + + +	+ 2.0	+ + + +	+ 2
36	+ 1.1	+ - - +	- 0.2	+ - - -	0
37	+51.5	+ + + +	+55.2	+ + + +	+54

The estimated equations give average relationships for the period 1948-58. But the true relationships may have been changing towards the end of, and after, this period. In order to forecast 1961, we require equations which reflect as closely as possible the structural relations holding in 1961. We have attempted to modify the estimated equations so as to obtain a closer approximation to these relations. The basis we have chosen for the modification is the performance of the equations during 1958-9 and the first two quarters of 1960. We have thus made adjustments with the latest data available and applied the resulting equations to 1961, on the assumption that the relations holding in 1958-9 are more like those of 1961 than are the average relations for 1948-58. We have calculated the residual terms in the individual equations for 1958 and 1959 and have solved the equations to give a 'hindcast' for 1959 (i) to 1960 (ii).

The calculated residuals for 1958 and 1959 are summarised in Table I. On the basis of these results, an adjustment to the constant term was calculated for each equation which showed a consistent bias during 1958 and 1959. The criterion of consistency was that seven out of the eight residuals should have the same sign. The adjustment was a weighted mean of the residuals in the two years, the weight for 1959 being twice that for 1958. Some exceptions were made in this procedure. No adjustment was made to the equation for exports to the dollar area, equation (12), which gave consistent under-estimates, since we considered the bias was likely to be reduced, or reversed, in 1961. Adjustments were made to equations (20), (23) and (25) for the general price level, the price of durable goods and the price of capital goods, although they did not show a consistent bias. We considered that their positive bias in 1959 was likely to continue into 1961. Similarly we judged that the negative bias in equation (24) for the price of non-food, non-durable consumer goods was likely to be reduced or reversed by 1961, and we have not made an adjustment to this equation. In addition, the adjustments used for the hindcast, which is described below, were not quite the same as for the 1961 forecast.¹

Inspection of the residuals and some trial solutions of the equations showed that equation (31) gave very erratic results, and it was therefore decided to drop this equation from the model and to treat profits, D , as an exogenous variable. All the results given below have been calculated on this basis.

As a check on the performance of the equations a hindcast was prepared for 1959 and the first two quarters of 1960. For this period the true values of almost all the predetermined variables could be substituted in the equations. Two solutions were obtained, one for the estimated equations given above,² and one for the modified equations. They are given in Table II (p. 64). On the whole the modified equations lead to a more accurate solution. They give values which fluctuate above and below the true values. In general, the quarter-to-quarter changes in the hindcast tend to be less than the true changes, and the trend is under-estimated for imports, exports and consumption. In contrast, the trend growth in prices is slightly over-estimated. The values for unemployment are the most erratic, and they contain errors of up to 40 per cent.

Although there are these deficiencies it seems unlikely that any further simple modifications would yield a substantially better solution for the period 1959 (i) to 1960 (ii). We have, therefore, taken the equations modified in the way described, as the model on which to base the forecast for 1961.

The results of the prediction depend both on the equations and on the

¹ In the hindcast the adjustment to equation (18) was +3 instead of +4, no adjustment was made to equation (20), and equation (37) was adjusted by +88 in 1959(i) and by +44 in 1959(ii)-1960(ii). The differences arise because the adjustments made for the forecast were determined in the light of the hindcast results.

² With one exception. Equation (37) was modified as described in footnote 1 above.

TABLE II
Hindcast Solution of Model

<i>Variable</i>		1959 (i)	1959 (ii)	1959 (iii)	1959 (iv)	1960 (i)	1960 (ii)
<i>P</i>	actual value	140.6	145.7	136.7	156.0	158.2	156.0
	computed without adjustments	146.7	144.4	144.9	155.7	164.3	160.5
	computed with adjustments ...	143.4	141.1	141.7	152.4	161.0	157.2
<i>U</i>	actual value	195.4	156.4	134.7	139.5	145.4	113.9
	computed without adjustments	161.0	105.2	49.1	80.1	32.5	77.4
	computed with adjustments ...	213.4	157.8	100.7	130.6	84.0	129.1
<i>I</i>	actual value	140.9	148.9	144.4	157.2	164.7	169.5
	computed without adjustments	140.6	140.1	142.4	144.9	151.0	154.3
	computed with adjustments ...	145.0	144.5	146.8	149.2	155.4	158.7
<i>X</i>	actual value	141.2	150.9	141.8	158.8	161.3	157.3
	computed without adjustments	157.3	151.8	149.0	159.4	165.4	163.8
	computed with adjustments ...	154.0	148.5	145.8	156.1	162.1	160.5
<i>C_f</i>	actual value	113.4	122.0	125.7	131.0	119.2	125.9
	computed without adjustments	113.6	119.5	125.9	129.5	117.0	122.6
	computed with adjustments ...	113.5	119.3	125.4	129.4	116.7	122.5
<i>C_d</i>	actual value	212.4	256.2	235.5	280.0	275.2	280.0
	computed without adjustments	178.1	205.0	206.8	234.7	202.6	215.0
	computed with adjustments ...	213.9	240.8	242.6	270.5	234.8	250.6
<i>C_o</i>	actual value	131.9	138.3	129.9	159.0	140.6	151.1
	computed without adjustments	126.6	135.0	135.3	156.4	133.5	142.0
	computed with adjustments ...	129.3	137.6	138.0	159.0	135.9	144.6
<i>p</i>	actual value	141.9	140.8	140.5	140.7	140.6	142.2
	computed without adjustments	138.1	138.3	139.9	139.6	143.0	144.4
	computed with adjustments ...	139.9	140.1	141.5	141.4	144.7	146.2
<i>w_y</i>	actual value	172.4	172.8	173.0	173.5	175.2	176.9
	computed without adjustments	166.0	165.5	169.1	171.3	174.7	174.6
	computed with adjustments ...	168.0	167.5	171.1	173.3	176.6	176.6
<i>w_g</i>	actual value	191.0	193.3	193.2	198.5	196.2	206.1
	computed without adjustments	183.7	183.4	188.5	191.4	195.5	197.9
	computed with adjustments ...	188.0	187.6	192.4	195.7	199.7	202.1

values given to the predetermined variables. The true values of these variables in part or all of 1960 are not known, and values have also to be attributed to the exogenous variables in 1961. A difficult problem of forecasting must therefore be undertaken before the model itself can be used to forecast the endogenous variables. We have no particular competence to judge the unknown values of the predetermined variables. We have set them on the basis of published economic commentaries, and we have also been greatly helped by advice from members of the National Institute of Economic and Social Research, to whom we are most grateful. But the responsibility for the values used is ours, and errors will, of course, be reflected in the predicted values of the endogenous variables. These 'Forecasts for 1961' are therefore best considered as a testing of the model, given particular assumptions set out in Table III about the values of the predetermined variables.

Our assumptions, generally, are that tax and subsidy payments will be

TABLE III

Values of Exogenous and Other Predetermined Variables used in Forecasts for 1961
(Assumed Values in Parentheses)

Index numbers, 1948=100. Not seasonally adjusted

Variable	1960 (i)	1960 (ii)	1960 (iii)	1960 (iv)	1961 (i)	1961 (ii)
<i>P</i>	158.2	156.0	145.3	(160)		
<i>C_f</i>	119.2	125.9	127.7	(134)		
<i>C_d</i>	275.2	280.0	236.8	(265)		
<i>C_o</i>	140.6	151.1	147.0	(157)		
<i>p</i>	140.6	142.2	142.1	(143)		
<i>p_h</i>	147.6	148.2	(150)	(151)		
<i>E_g</i>	93.5	93.7	94.2	(94)	(94)	(94)
<i>D</i>	192.7	213.8	(200)	(215)	(195)	(210)
<i>T_w</i>			(118)			
<i>T_d</i>			(95)			
<i>T_g</i>			(57)			
<i>T_i</i>	119.2	99.9	(100)	(100)	(120)	(100)
<i>S_u</i>			(62)			
<i>G_k</i>	(183)	(160)	(170)	(190)	(190)	
<i>G_s</i>	171.1	166.5	(161)	(161)	(173)	
<i>S_d</i>	124.2	127.7	154.9	(155)	(150)	
<i>S_m</i>	67.0	65.4	77.9	(78)	(78)	
<i>X_f</i>	162.1	151.4	155.4	(180)		
<i>X_e</i>	190.8	187.3	161.4	(175)		
<i>X_o</i>	130.3	126.6	120.6	(140)		
<i>p_i</i>	118.4	117.2	116.4	(116)		
<i>p_{im}</i>	130.2	129.8	130.6	(128)		
<i>p_{met}</i>	175.3	172.9	163.0	(158)		
<i>p_x</i>	144.2	144.6	144.6	(147)		
<i>P_g</i>	(157)	(154)	(149)	(150)	(150)	
<i>P_{or}</i>	257.1	268.3	(241)	(275)	(270)	
<i>P_l</i>	151.2	(153)	(153)	(153)		
<i>p_g</i>	113.4	113.4	(113)	(113)	(113)	
<i>p_{wf}</i>	129.4	(131)	(132)			
<i>p_{xc}</i>	146.3	(147)	(147)	(147)		
<i>B_l</i>	118.4	118.6	114.3	(112)		
<i>R</i>	90.8	91.9	96.7	(101)		
<i>P_{wf}</i>	(178)	(180)	(180)			
<i>P_{we}</i>	(178)	(181)	(181)	(181)	(181)	

at slightly higher rates than in 1959. Government expenditures are assumed to increase slightly during the first two quarters of 1961. Activity has fallen in the dollar area (particularly in Canada and the U.S.A.). Informed judgments, together with econometric forecasts there, suggest a continued low level of production during early 1961. Prices have been steady there recently and are expected to remain stable, as are prices in the rest of the world.

The solution of the system for the principal endogenous variables in the first two quarters of 1961 is given in Table IV.¹ The values given are seasonally *unadjusted*.

The level of industrial production forecast by the model is slightly higher than in the corresponding quarters of 1960. Between 1961 (i) and 1961 (ii) a counter-seasonal fall in industrial production is indicated. (In terms of the published index the forecast values, seasonally unadjusted, are 125 for 1961 (i) and 122 for 1961 (ii).) As can be seen in Table IV, the value of *P* fell

¹ The solution was obtained on January 10th, 1961.

TABLE IV

Recent Actual Values and Forecasts for 1961 of Principal Endogenous Variables

Variable	1959 (i-iv av.)	1959 (i)	Actual values				Forecast values	
			1959 (ii)	1960 (i)	1960 (ii)	1960 (iii)	1961 (i)	1961 (ii)
<i>P</i>	144.8	140.6	145.7	158.2	156.0	145.3	160.2	156.3
<i>U</i>	156.5	195.4	156.4	145.4	113.9	100.9	147.5	173.1
<i>I</i>	147.9	140.9	148.9	164.7	169.5	162.8	160.5	160.9
<i>X</i>	148.2	141.2	150.9	161.3	157.3	142.3	164.9	160.4
<i>C_f</i>	123.0	113.4	122.0	119.2	125.9	127.7	119.7	125.1
<i>C_d</i>	246.0	212.4	256.2	275.2	280.0	236.8	240.1	254.8
<i>C_o</i>	139.8	131.9	138.3	140.6	151.1	147.0	141.6	149.4
<i>p</i>	141.0	141.9	140.8	140.6	142.2	142.1	147.7	148.6
<i>w_r</i>	172.9	172.4	172.8	175.2	176.9	177.9	183.9	185.2
<i>w_e</i>	194.0	191.0	193.3	196.2	206.1	199.7	209.2	211.4

between the first two quarters of 1960, but rose in the same period of 1959. The latter movement conforms to the normal seasonal pattern.

The forecast figures for unemployment correspond to 448,000 and 526,000 in the first two quarters of 1961. The first figure is slightly above the value for 1960 (i) and the increase in the second quarter is counter to the expected seasonal movement. The forecasts for unemployment compare with a figure of about 350,000 in the fourth quarter of 1960, suggesting a rise in unemployment between 1960 (iv) and 1961 (i) of rather more than twice the usual seasonal movement.

The forecasts for foreign trade show little change between the two quarters, with imports slightly below and exports slightly above the corresponding values for 1960.

The consumption of durables is forecast to be considerably lower than in the first two quarters of 1960.

The forecasts for prices and wages show a sharp rise above their values in 1960.

A POST MORTEM ON ECONOMETRIC FORECASTS FOR 1959

By ARTHUR HAZLEWOOD *and* PETER VANDOME

In the February 1959 issue of the *BULLETIN* a set of forecasts for the first two quarters of 1959 was given.¹ These forecasts were derived from an econometric model of the United Kingdom. It is now possible to compare the forecasts with what actually happened, and thus to assess the usefulness of the model presented as a forecasting tool.

The econometric model comprises a set of thirty equations and seven identities, which is intended to reflect the structure of the economy. The parameters of the thirty equations have been estimated from quarterly statistical data for the period 1948-56 (with minor exceptions). The data are in the form of time series, which are treated as a sample of economic experience. The difficulties which can arise whenever economic time series are used in this way may therefore occur. The equations are set out in full in the Forecast. A detailed description of the construction of the model will appear in a monograph which is at present in the press.

In this system of relationships we distinguish three types of variable. There are, first, endogenous variables determined by the working of the system. For a unique solution to be possible there must be the same number of equations as endogenous variables. In an aggregative model such as we are considering, examples of the endogenous variables are industrial production, wages and the price level. It is the values of the endogenous variables which we attempt to forecast. The second class of variable comprises exogenous variables which we regard as determined from outside the system. The border-line between endogenous and exogenous variables is necessarily rather ill-defined and a variable may be regarded as endogenous for some purposes and exogenous for others. In the present econometric model variables such as tax rates, which are determined by decisions of government rather than by an economic process, are treated as exogenous. 'Foreign variables' such as the price of imports and levels of activity in overseas countries are also exogenous. In a dynamic model there will be a third type of variable, the lagged endogenous variable. For example, we may relate current consumption to consumption in some earlier period. In the current time period these variables are already determined (either because data on them are available, or because a solution has been obtained for the earlier period), and the exogenous and lagged endogenous variables are together classed as 'predetermined' variables.

The equations of the model reflect the average relationships which existed during the period from which the data were drawn. In using them

¹ 'Econometric Forecasts for 1959,' *BULLETIN*, 1959, pp. 3-16. This article will be referred to as the Forecast.

for forecasting two important assumptions must be made. First we suppose that the relationships will hold good in a period outside the limits of the sample. The validity of this assumption will depend largely upon how successfully structural, stable relationships have been estimated, and upon whether, and how fast, the economic structure is changing. The second assumption is that the *average* relationships hold exactly for the forecast period. Each equation is formulated in terms of economic variables and a random term reflecting influences which are not introduced explicitly. Over the whole sample period the average of the random term is zero, but it is not necessarily zero in any particular quarter. In solving the equations to give a forecast, the random terms are approximated by the value zero. This approximation may give a bias to the forecast values, particularly if the random terms in different equations are correlated.

It follows that a model which reflects the structure of the economy during the sample period reasonably accurately may not perform well as a forecasting tool. In forecasting, then, it may be desirable to adjust the set of equations in the ways explained below. A more successful forecast is likely to be achieved by adopting this kind of pragmatic method than by accepting the estimated equations uncritically.

In fact a number of changes were made to the econometric model for the Forecast we are considering. A number of relationships had not been estimated satisfactorily at the time the Forecast was prepared, and were discarded. They were equations (22) and (31), giving the price of food and profits. Another equation, (36), giving wage and salary income was discarded for part of the Forecast.¹ Of these three equations, (31) and (36) are described as 'identities', which are used to complete the system. That identities should be abandoned as unsatisfactory is rather surprising. The explanation is that equations (31) and (36) are only *approximations* of identities.² For example, equation (31) is intended to express the identity between total output and total income. If the model had been constructed in a national accounts framework the identity would be between gross national product and the sum of factor incomes. In fact, the model uses different variables. It is constructed in terms of industrial production, wage and salary income, and company profits. Between these variables there is only an approximate equality.

A second set of modifications have been made to equations which are satisfactory over the sample period, but not subsequently, thus suggesting that the structural relation they measure is changing. We attempt to adjust the equation to give a structural equation for the forecast period rather than the sample period. The subjective element in the adjustment may be reduced by studying the residuals (the difference between the actual and the computed value of the variable on the left-hand side of the equation) in each equation. Where the residuals show a systematic bias at the end of, or beyond the end

¹ See note to Table II of Forecast.

² Although the term 'identity' is not strictly correct, it will be used here for the sake of brevity.

of the sample period, a correction term equal to the mean value of the residuals in recent time periods can be added to the equation for the forecast. As a result of such an investigation, corrections were made to three equations. They were (21), (30) and (37), giving hours worked, non-industrial labour supply, and unemployment, respectively.¹

The processes so far described lead to a set of equations which we apply to the time periods for which we require a forecast. But before the forecast can be produced another fundamental problem must be faced. In order to solve the equations simultaneously for the endogenous variables, values must be given to the predetermined variables. If we are trying to forecast what will actually happen, then we should insert the true values of the predetermined variables. The values of some will be known, but many will be unknown, either because they relate to a future time period or because data have not become available. A considerable forecasting problem is therefore posed by the predetermined variables, and the values used can often be no more than guesses, or simple extrapolations from earlier values. Table I shows the assumptions which were made for the Forecast, together with the actual values of the predetermined variables.

We may summarise these considerations in the statement that all forecasts are necessarily conditional forecasts. The econometric forecasts are conditional on assumptions about structure and the predetermined variables which are made explicit, so that their basis may be examined and modified. In some situations, such as in examining the implications of policy measures, a conditional forecast is required, and the problems we have discussed will be simplified. In the present context we would like an unconditional forecast, but are forced to accept one which is conditional.

The econometric forecasts which were prepared in the way outlined above, are given in Table II below. There are two comparisons we shall make in order to assess their success.

First, we compare the forecast with the actual values of the variables. Here we are testing the whole procedure of forecasting, not only the validity of the equations of the model. The assumed values for the predetermined variables and the adjustments made to the equations will also affect this comparison.

Secondly, we try to isolate the working of the model itself by making an 'extrapolation', or 'hindcast' for the first two quarters of 1959. Here, we insert the true values of the predetermined variables, wherever possible, and obtain the solution for the endogenous variables. It has not always been possible to obtain the true values of the predetermined variables for a variety of reasons. Some of the series have had to be constructed in a different way for 1958 and 1959 than for earlier periods, though it is not thought that such discrepancies have had an important influence on the results. For other

¹ Equation (37) is an identity of the same type as (31) and (36). The true identity could not be expressed since data deficiencies lead to some double counting of workers who are temporarily stopped.

TABLE I

Values of Exogenous and Other Predetermined Variables used in Forecasting the First Two Quarters of 1959

Variable	1959 (i)		1959 (ii)	
	assumed for forecast	actual	assumed for forecast	actual
(C _d)t-1, o	(228.0)	250.6	*	214.4
(C _f)t-1, o	(125.0)	128.0	*	110.7
(C _o)t-1, o	(144.0)	130.9	*	116.9
(X _e)t-1, o	(166.0)	168.8	*	164.5
(X _f)t-1, o	(185.0)	188.9	*	134.5
(X _o)t-1, o	(110.0)	120.3	*	117.6
(D)t-1, o	(178.0)	181.1	*	(157.8)
(D) _t , o	(160.0)	(157.8)	(170.0)	(188.5)
(G _k)t-1, o	(165.0)	163.9	(167.0)	(166.0)
(G _s)t-1, o	(146.0)	150.0	(150.0)	155.8
(r)t-4, o	176.9	176.9	171.9	171.9
(p _k)t-1, o	(154.0)	143.3	*	141.7
(T _w)t, o	(96.0)	(110)	(96.0)	(110)
(T _d)t, o	(92.0)	(100)	(92.0)	(100)
(T _{d'})t-1, o	(80.0)	(75)	(80.0)	(75)
(P)t-1, o	(137.5)	142.3	*	140.2
(P)t-2, o	(126.0)	126.7	(137.5)	142.3
(R)t-2, o	(111.7)	103.4	(112.5)	101.6
(S _m)t-1, o	(79.4)	81.7	(79.4)	75.2
(p _{met})t-2, o	155.9	155.9	(150.0)	158.7
(p _{met})t-3, o	147.5	147.5	155.9	155.9
(p _{met})t-4, o	150.4	150.4	147.5	147.5
(E _g)t, o	(92.4)	93.0	(92.4)	93.4
(w _r)t-4, o	(166.1)	166.5	(166.7)	167.0
$\frac{1}{8} \sum_{i=1}^8 (C_d)t-i, o$	(202.5)	195.5	*	202.8
$\frac{1}{8} \sum_{i=1}^8 (C_o)t-i, o$	(127.5)	117.2	*	118.1
$\frac{1}{8} \sum_{i=1}^8 (C_f)t-i, o$	(115.9)	117.9	*	118.1
$\sum_{i=1}^3 (U)t-i, o$	(480.0)	465.1	*	515.5
(p)t-4, o	141.5	142.6	*	144.4
$\sum_{i=1}^3 (p)t-i, o - p)t-i-4, o$	(4.2)	9.6	*	6.9
(p _i)t-2, o	116.7	116.7	(115.0)	117.2
(T _i)t, o	(100.0)	117.1	(100.0)	102.5
(p _{im})t-2, o	133.3	133.3	(128.0)	126.0
(p _{xc})t-2, o	(143.0)	140.4	(143.0)	139.5
(P _g)t-1, o	(141.5)	146.6	(142.0)	(149.3)
(P _g)t-1, o	(110.8)	112.8	(110.8)	113.8
(P _{er})t-1, o	(220.0)	238.1	(212.0)	228.6
(p _{er})t-1, o	(140.0)	142.3	(141.1)	143.2
(P _f)t-2, o	(117.0)	127.8	(116.0)	123.0
(B _f)t-2, o	(70.0)	(77.5)	(68.0)	(76.9)
(P _f d)t-3, o	(149.0)	148.3	(140.0)	142.6
(B _f d)t-3, o	(230.0)	(218.1)	(228.0)	(229.1)
(P _w f)t-3, o	(130.0)	130.7	(130.0)	131.0

* The value used was derived from the solution for the first quarter of 1959.

NOTE. Figures in parentheses are based on judgment or on incomplete data. All values are seasonally *unadjusted*.

series the values for 1959 were not available. The most important in this group are the tax rate variables and wage and salary income, which can only be constructed from data in the 1960 National Income Blue Book, which had not been published when the computations were carried out. It has been necessary to use estimated values, but the estimates given in the Forecast have been revised in the light of the 1958 figures. Capital formation by public authorities has been treated in the same way. Estimated values have also been used for sterling balances since it is no longer possible to obtain separate figures for the independent and dependent sterling areas as defined for the model.

As for the Forecast, a number of modifications were made to the model before it was solved for the extrapolation. The unsatisfactory equations, (22), (31), and (36) were again discarded and the endogenous variables involved were treated as predetermined.¹ The true values have therefore been used in the extrapolation, except for wage and salary income for which data were not available. For this variable estimated values have been used, these estimates again being revisions of those given in the Forecast. Equation (37), the identity giving unemployment, was adjusted in the same way as for the Forecast. The other two equations which were adjusted for the Forecast, (21) and (30), were left in their original form.

In summary, the extrapolation is affected by the use of certain assumed values of predetermined variables; by the fact that certain endogenous variables are regarded as predetermined; and by the adjustment to the identity for unemployment. The last point will be taken up at greater length below. The second point should lead to an improvement in the extrapolation insofar as we can replace the variables by their true values. The assumed values which have been used will mainly affect the consumption equations in which wage and salary income and tax rates appear. The extrapolated values of the consumption variables may therefore fail to give an accurate test of the performance of these equations.

In making the extrapolation for the first quarter of 1959, we simply give the predetermined variables their true values² and solve the resulting set of simultaneous equations. When we come to extrapolating to the second quarter of 1959 there are two possible methods. Where the predetermined variables are endogenous variables lagged one quarter we could use either the true value, or the value obtained from the solution for 1959 (i). In fact we have used each to give two extrapolations for 1959 (ii). We shall refer to the 'pure-extrapolation' in which true values are used, and the 'forecast-extrapolation' in which appropriate results from the solution for 1959 (i) are used.

Table II gives the results of our calculations, with a graphical representation in Figure 1.

¹ In the Forecast, estimates were given on the basis of wages and salaries as both endogenous (obtained using equation (36)) and predetermined. The latter were clearly regarded as more satisfactory. See note to Table II of the Forecast.

² Or, where necessary, an assumed value.

TABLE II
Actual and Forecast Values of Principal Variables

Variable	Actual values				Extrapolation		Forecast	
	1957 (iv)	1958 (i)	1958 (ii)	1958 (iii)	1958 (iv)	1959 (i)	1959 (ii)	1959 (b)
P	142.8	143.2	136.3	126.7	142.3	143.7	138.3†	139.7
I	138.2	136.8	133.5	137.0	145.5	139.4	138.9	136.2
X	147.3	144.8	137.3	139.1	147.2	151.1	153.8	141.2
U	101.8	137.6	145.0	146.4	173.7	169.6	180.3	189.0
P	141.4	142.6	144.4	142.6	143.7	141.2	146.1	138.7
w _r	165.5	166.5	167.0	169.0	171.4	166.8	174.6	166.8
w _e	184.5	184.3	186.0	185.8	188.7	185.9	193.5	185.1
C _d	200.1	191.6	204.3	191.6	250.6	175.6†	181.5†	225.6
C _o	126.8	113.2	116.6	113.8	130.9	109.1†	116.4†	119.7
C _f	125.7	111.1	116.2	120.0	128.0	108.2*	112.9*	113.4
								119.7

† Actual (or estimates of actual) values of W, D used.

* Actual (or estimates of actual) values of W, p† used.

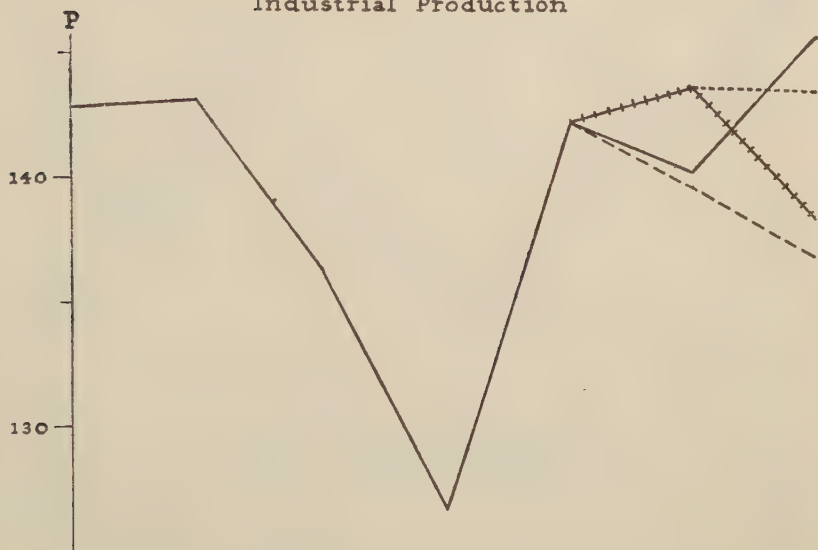
† Estimate of actual value of G_{k-1} used in equation (3).

(b) The forecast obtained with an adjusted value of wage and salary income is given. See Table II of Forecast.

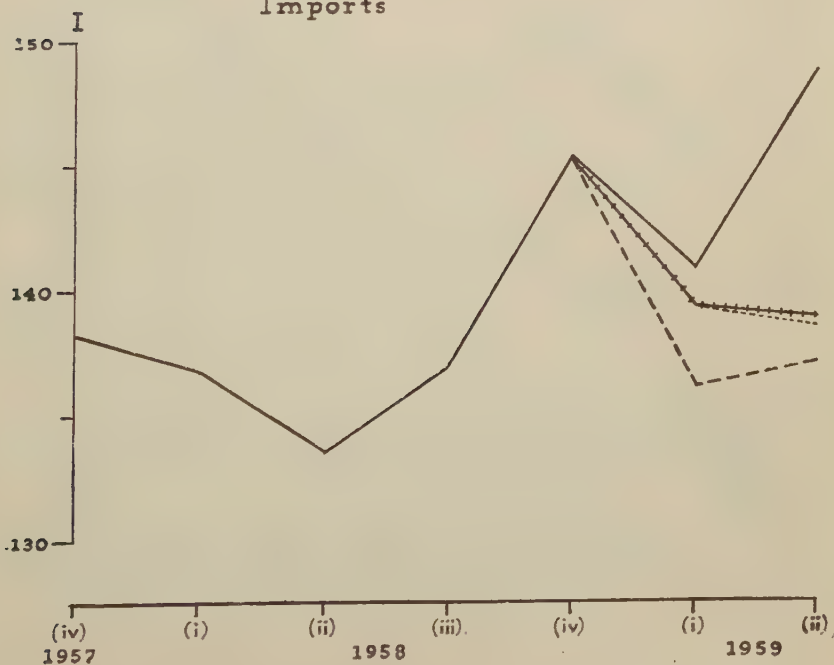
Figure 1

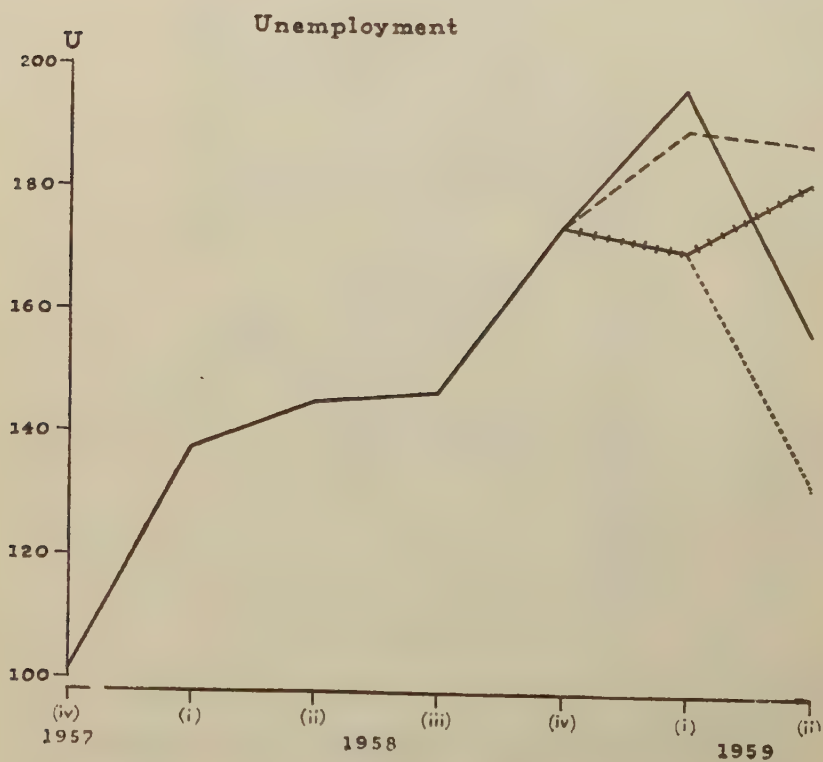
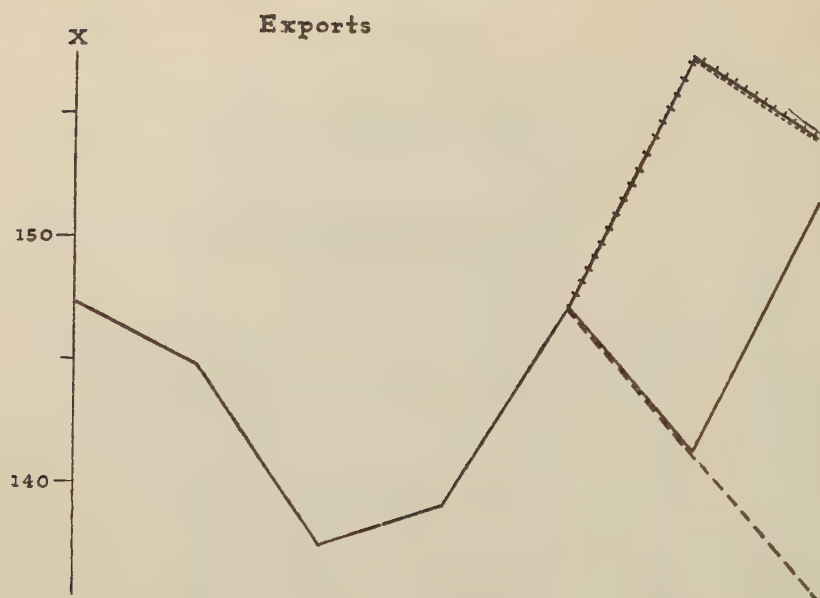
Actual value —————
Pure extrapolation —+—+—+—
Forecast extrapolation - - - - -
Forecast - - - - -

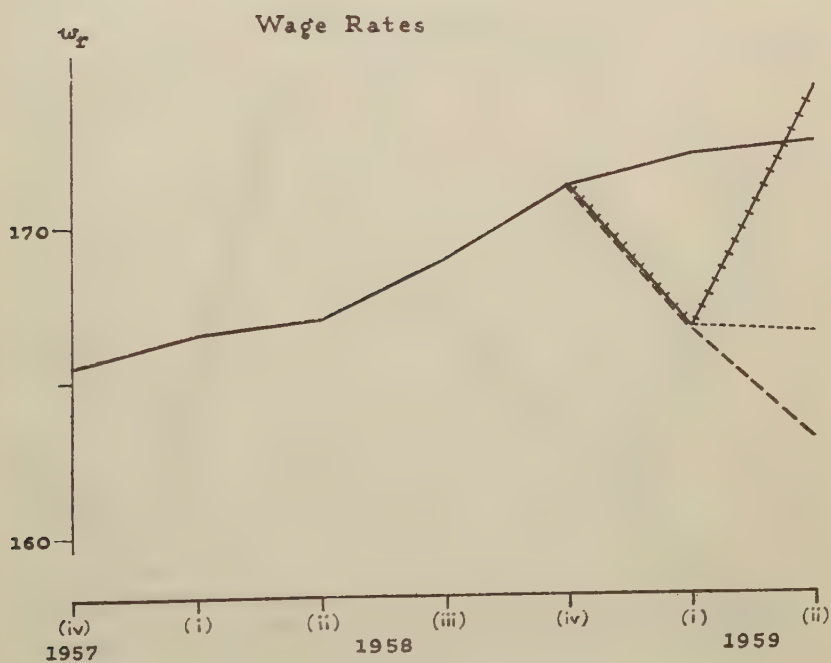
Industrial Production



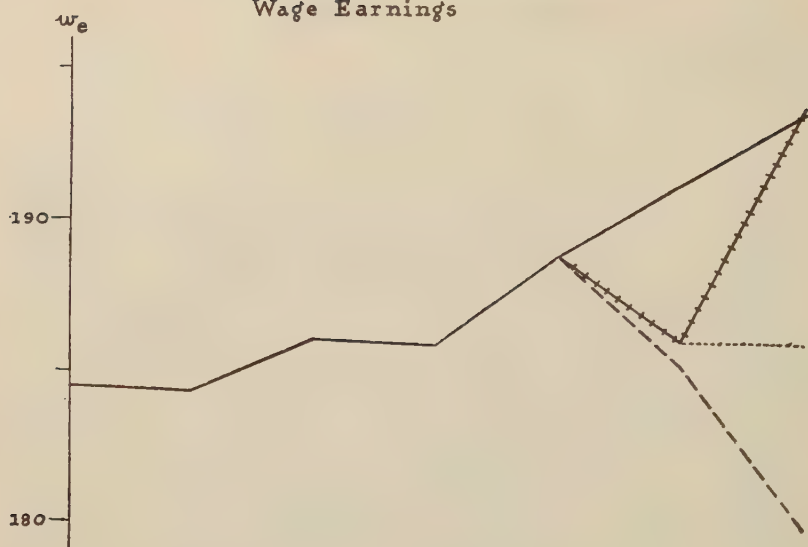
Imports



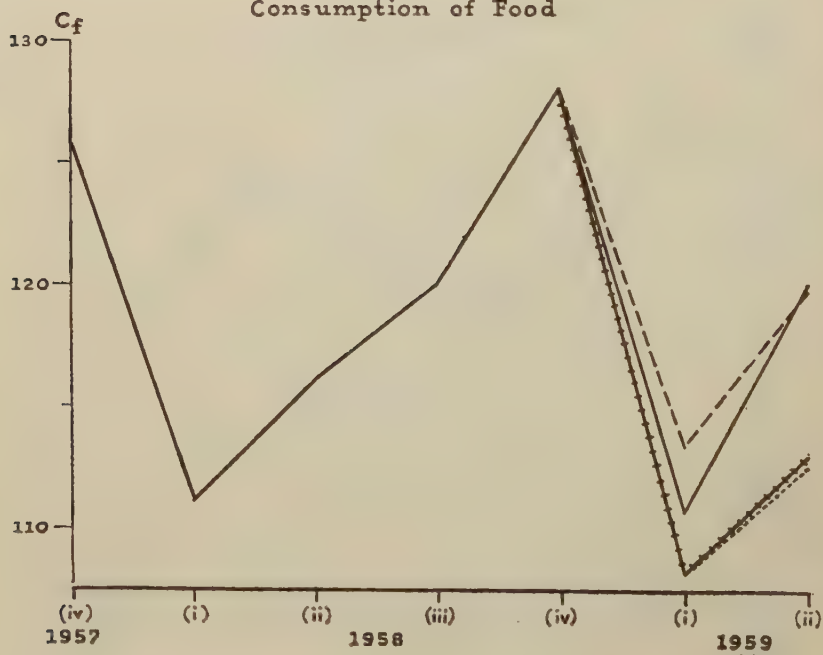




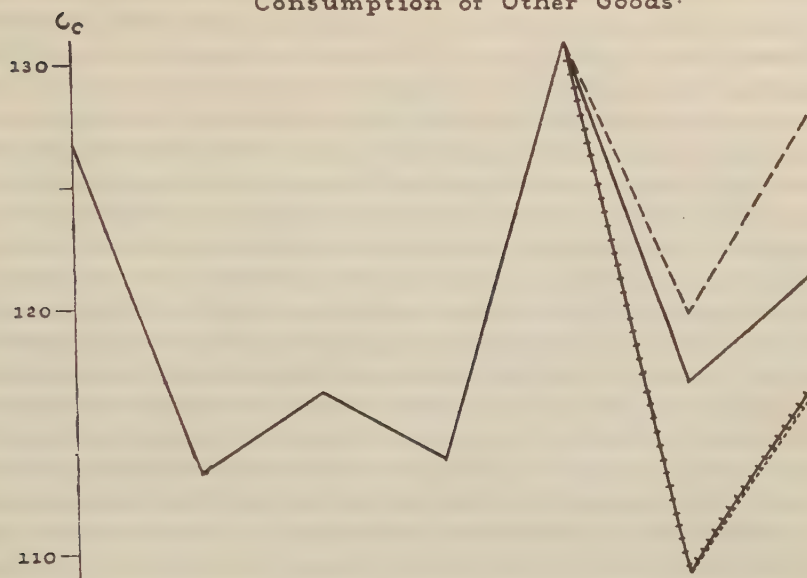
Wage Earnings



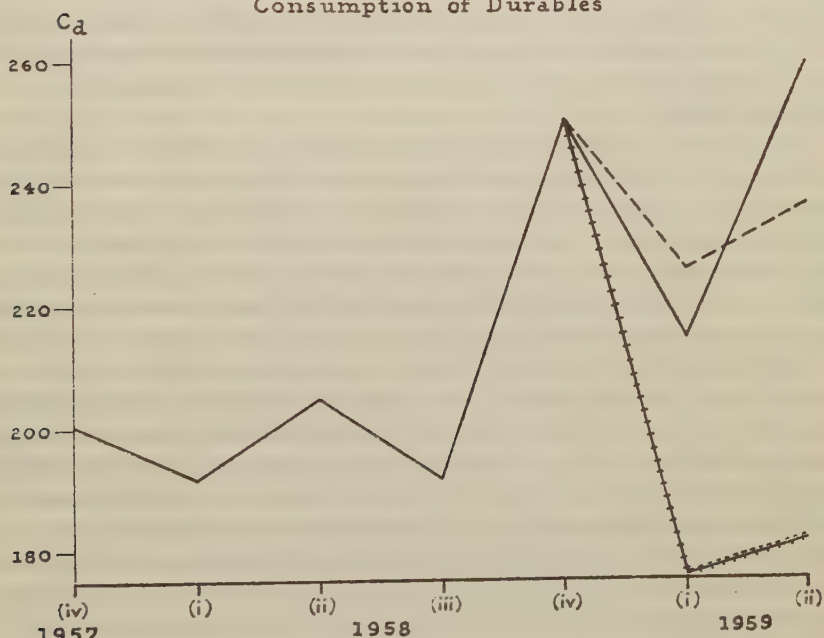
Consumption of Food



Consumption of Other Goods.



Consumption of Durables



The period from the fourth quarter of 1958 to the second quarter of 1959 was one when the recovery from the recession got under way. Production rose sharply from 1958 (iii) to 1958 (iv) to almost the level of 1957 (iv). There was then a slight fall, followed by a rise of 5 points in 1959 (ii). There was a delay before unemployment fell, suggesting that the rise in production was associated with increasing productivity rather than increasing employment. Peak unemployment was reached in 1959 (i), and was followed by a substantial fall, but one which left unemployment considerably higher than in 1958 (ii). Prices remained virtually steady, but wages rose. The change in wage rates was small, and about the same as that for the corresponding period of 1957-58. Wage earnings, however, rose rapidly. After remaining fairly steady for a year, they rose by $2\frac{1}{2}$ points a quarter during 1958 (iv) to 1959 (ii). The series of consumption show a slight increase in food consumption, a rather larger increase in non-food, non-durables consumption, and a large increase in durables consumption, the value for 1959 (ii) being 260 compared with 204 in 1958 (ii). The movements of imports and exports also conform to the general picture of recovery which brought the economy out of the recession, but to a point only a little above (in terms of activity) that reached by the end of 1957.

When the forecast values are compared with the actual values the picture is seen to have been generally too pessimistic, and falls in production were forecast for the first two quarters of 1959. The forecast value for 1959 (i) is close to the true value, but that for the second quarter is nine points too small. Unemployment for 1959 (i) is accurately predicted, but roughly the same level was forecast for 1959 (ii) compared with 1959 (i), whereas a sharp fall occurred.

The values of the price and wage variables all reflect the pessimistic predictions for production, and substantial falls in these variables were forecast. The equations determining these variables are reversible, in that no distinction is made between positive and negative changes. In reality prices and wages increase more easily than they decrease. This shortcoming of the model was recognised in the text of the Forecast where it was predicted that prices and wages would remain steady rather than decrease.

The consumption equations perform better, but tend to over-estimate the actual values. The direction of changes in consumption are all accurately predicted. The magnitude of the changes are reasonably accurate with the one exception that the large increase in the consumption of durables between 1959 (i) and 1959 (ii) was under-estimated. In assessing the performance of the consumption equations it should be remembered that the quarter to quarter changes are largely the result of seasonal variation. So long as the pattern of seasonal variation remains unchanged it should be relatively easy to predict consumption.

The predictions for imports and exports in 1959 (i) are reasonably good. Exports, in fact, were predicted exactly, but imports were under-estimated. In 1959 (ii), however, a continued decline in exports was forecast, where

there was actually a substantial rise. A rise in imports was correctly forecast, but its magnitude under-estimated.

When the Forecast was made, the values of the variables for 1958 (iv) were unknown. Compared with 1958 (iii) a substantial recovery of production, but one which did not make up the losses in the recession, was forecast. This happened, but the recovery was rather stronger than that forecast. Unemployment was forecast to rise sharply during the first part of the recovery. This too occurred, and the turning point in 1959 (i) was identified correctly, but the subsequent decline in unemployment was under-estimated. Consumption was expected to increase steadily. The increase was slightly over-estimated except for durables consumption in 1959 (ii). Prices and wages were expected to remain steady, but in fact wages rose. The level of foreign trade in 1959 (ii) was under-estimated. These results point to the conclusion that the up-turn was correctly forecast, but that the strength and speed of the recovery was under-estimated.

The extrapolation, when compared with the Forecast, is seen to give better results for wage rates and earnings, for prices, and for imports, but worse results for consumption. For production, unemployment and exports the results are different, and it is difficult to say which are the more accurate. On the whole the extrapolated values for 1959 (ii) are more accurate than those for 1959 (i).

The extrapolated value for production in 1959 (i) is too high, and that for 1959 (ii) too low. The pure-extrapolation is considerably less than the forecast-extrapolation which is only two points below the actual value.

The extrapolated values of unemployment are all less than those forecast. A decline is shown for 1959 (i) whereas a rise occurred. For 1959 (ii) the pure- and forecast-extrapolations give very different results, which are about equally above and below the actual value. It is clear that the equations determining unemployment are sensitive to very small changes in other variables, and it could well be that small adjustments to the level of hours worked and total employment, similar to those made for the Forecast, would have changed the results considerably. The pure-extrapolation gave a value of total employment 2.7 points too small. A correction of this amount in (37) would decrease the value of unemployment by 46 points, which is twice the error in the original figures. In absolute terms, 46 points represents about 140,000 unemployed, compared with total unemployment of 475,000 in 1959 (ii).

When we consider wages and prices we see that the values for 1959 (i) all show a fall, compared with a rise in the true values, but the fall is not as great as in the Forecast. In 1959 (ii) the forecast-extrapolation shows steady wages, and rising prices, while the pure-extrapolation shows all three variables rising sharply to levels a little above the true values.

The extrapolated values of consumption are all too small, especially for durables, and there is very little difference between the pure- and forecast-extrapolations. The difference from the Forecast can be accounted for by the values of wage and salary incomes, and of tax-rates. In the Forecast a higher

value was assumed for the former and a lower value for the latter, compared with the estimates we have used in the extrapolations.

The distributed lag in equation (6) for the consumption of durables has a negative coefficient. Unlike the other consumption equations, there is no strong presumption that the distributed lag in equation (6) should have a positive coefficient, since periods of high expenditure on durables could be followed by periods of retrenchment. Nevertheless, the suspicion remains that our poor results arise because we have not succeeded in estimating the structural equation, especially as estimates with a sample extended to 1958 have a positive coefficient for the distributed lag.

There is one important factor which does not enter equation (6), and which would probably improve its performance. Several attempts were made in constructing the model to incorporate a variable reflecting the effects of hire purchase controls. Unfortunately no significant results could be obtained, with the 1948-56 sample, and the variable had to be abandoned. Even if hire purchase controls played no independent part during that period, their relaxation in 1958 was partly responsible for the 1959 boom in consumer durables.

Imports are more accurately predicted in the extrapolation than in the Forecast, but the values are still below the true values. As with unemployment, the estimates of exports seem to be unstable. The Forecast gave a fall in 1959 (i) to the true value, but the extrapolation gave a large rise. In 1959 (ii) all the predictions showed a similar fall, when in fact there was a rise, and the errors in the extrapolations cancelled out to give a value for 1959 (ii) which was only a little above the true value.

Conclusions

There are two questions which we may seek to answer as a result of this analysis: how much confidence should we place in forecasts such as those made in 1958? and what are the weak spots in the model which led to the greatest errors?

It is clear that the Forecast values cannot be accepted as giving the levels of production, unemployment, consumption, wages, prices and foreign trade to the nearest point or two, and such a claim has never been made. Even if we have successfully estimated a set of structural equations, they are not deterministic equations, but contain a stochastic, or error, term. Unless we can predict the values of the error terms in particular quarters the most we may reasonably expect is to predict the order of magnitude of variables, and to pick out turning points. Success in achieving these aims alone would make the exercise worth while. Combined with forecasts made by other methods they would help to build up a comprehensive picture of the future outlook for the economy. Even in the light of this limited aim, the Forecast has not been uniformly successful, but it has predicted the direction of many of the changes accurately and for several of the variables has given predictions at least as accurate as could be obtained by other means. We feel that it is worth

investigating the deficiencies in the model, and attempting to improve its forecasting powers.

The main weaknesses which have appeared in this analysis are in the equations determining employment (and unemployment) and wages and prices. The main objection to the wage and price equations lies in their reversibility. The identity (37), which has already been discussed, contributes considerably to the difficulty in predicting unemployment. Further difficulty appears to arise from the way in which the equations must be solved to give the computed value of industrial employment. In the solution, production is determined by equations (2)–(4), imports by equations (9)–(11), and hours worked by equation (21). These values are then substituted in the production function, equation (1), to give the value of industrial employment, E_p . The values of E_p obtained in this way fluctuate more widely than the true values. And even comparatively small errors in the computed values of employment will lead to large errors in our index of unemployment.

The excessive fluctuations in the computed values of E_p occur presumably because changes in output per man hour are not taken into account in the equations leading to the value of E_p . The changes in production during the period 1958 (iii) to 1959 (ii) were associated with changes in output per man hour rather than with changes in the number employed. Output per man hour (measured by P/hE_p) rose by 13 per cent between 1958 (iii) and 1958 (iv). In the next quarter it fell by one per cent, and then rose by three per cent. These movements are very similar to those in production.

We have already pointed out that the speed of recovery was underestimated. In part this happened because at a turning point factors which are not included in the production decision equations could be important. A model in which stocks play a more important role should give improvements, but it is also desirable to take account of business expectations if possible.

Another difficulty connected with turning points arises from the fact that the turning points of different variables do not coincide in time. In particular, peak unemployment was reached in 1959 (i), whereas the recovery in production began two quarters earlier. The model did not seem to allow variables such as these to move out of step to a sufficient degree.

Output per man hour appears in the model as a determinant of the spread between wage earnings and rates (equation (19)). This equation forms the main link between the variables expressed in real terms and those expressed in money terms. Under-estimates of P/hE_p lead to under-estimates of the wage spread. The pure-extrapolation gives an under-estimate of P/hE_p of one-half per cent in 1959 (i), and of five per cent in 1959 (ii). These errors have, however, been offset by over-estimates of hours worked, and the net result for the extrapolation has been to over-estimate the wage spread for 1959 (i) and to under-estimate it for 1959 (ii).

The export equations give unstable results, and it may be that factors relating to home demand, as well as to foreign demand for U.K. exports, should be included in the equations.

THE DISTRIBUTION OF PERSONAL WEALTH IN BRITAIN

By H. F. LYDALL and D. G. TIPPING

INTRODUCTION

In the past twenty years the distribution of personal income in Britain has become significantly less unequal. According to estimates made by one of the present authors the proportion of real disposable income received by the top one per cent of the population fell from about 12½ per cent in 1938 to about 6½ per cent in 1957 [1, p. 31]. But the resources available to an individual depend not only on his income but also on his capital (including his ability to borrow). Accumulated wealth can be used—to a greater or less degree—in the same way as income to give command over current goods and services. At the present time the stock of personally owned capital (including debts owed to persons by the government and others) is equivalent to about four years' disposable income; and for those in the income class £2,000 and over it is, on the average, probably as much as ten years' income. It is obvious, therefore, that people with appreciable amounts of capital (who are mostly but not exclusively in the upper income classes) are in a position to arrange their current expenditures without strict regard to their incomes. This freedom of manoeuvre is important not only to those who persistently overspend their incomes but also to that much larger class of persons who are able to use their capital to finance heavy temporary expenditures—such as on the education of their children—which may be of great long-term importance in maintaining their (or their children's) standard of living and status in society. Wealth gives power; indeed, it gives more power than income, because it is largely free of current commitment (and of current taxation).

For these reasons alone there is a case for paying some attention to the distribution of wealth. But there are two further reasons for an inquiry into this subject. The first is that, since 'capital' is the second of the great factors of production, the conditions governing its supply—one of which is the distribution of its ownership—are of fundamental importance.

The second additional reason for studying the distribution of capital is one that is peculiar to this country. All previous studies have shown that the distribution of personal wealth in Britain is extremely unequal [3, 4, 5, 9]; and in a recent comparison [2]—based on survey data—it was found that the distribution of wealth was substantially more unequal in Britain than in the United States (and this despite the fact that the distribution of *income* in the two countries was rather similar, and if anything more unequal in the United States).

Despite the various attempts that have been made to discover the facts about the distribution of capital in Britain, the most striking aspect of this subject is the statistical darkness which surrounds it. In this respect Britain is

no worse than most other countries (the main exceptions are the Scandinavian countries), but it is nevertheless remarkable that a subject which is of the importance indicated above has so far been kept so much of a mystery. One of the conclusions that will be drawn from the present study is that the available data are grossly inadequate for the purpose in hand.

The purpose of this paper is to see what can be done with existing data to throw light on the following questions: First, what is the current total value of net capital owned by persons in Britain? Secondly, how is this capital distributed? Thirdly, what are its major components, and how are they distributed? Fourthly, what is the degree of concentration of ownership of personal capital as a whole, and of its main components? Fifthly, what have been the trends in the degree of concentration of capital and in its composition over the past few decades? And finally, how is capital distributed between age groups?

But before we proceed to address ourselves to these questions we shall give a brief outline—in the following section—of the statistical sources and methods employed in this study. More complete details about the methods used are presented in the appendix.

SUMMARY OF SOURCES AND METHODS USED

Information on the distribution of personal wealth can be obtained at present from two main sources: the estate duty statistics and unofficial sample surveys. The estate duty statistics relate only to the persons dying in a given year and must therefore be further 'processed' if they are to throw any light on the situation in the population as a whole. Sample surveys can be designed to be representative of the whole population, or of a specified part of it. Information about the distribution of personal net worth has been collected in two national sample surveys—the savings surveys of 1953 and 1954—each of which was aimed to be representative of the non-institutional population of Great Britain. In this paper we shall make use of both these sources, drawing—in the case of the surveys—on the 1954 savings survey, which seems to have given a rather more complete picture than the preceding one [7, 2].

Both these sources suffer from serious defects. The estate duty returns cover only estates with a net value exceeding £3,000 (before 1954, £2,000, and before 1946, £100); they exclude certain forms of property (e.g. immovable property situated abroad, certain government securities, property settled on a spouse and passing on the death of the spouse, discretionary trusts, the assets of pension funds, and estates of persons killed on active service); and they undervalue others, either *de jure*, as in the case of owner-occupied houses in the post-war years (until 1958), or *de facto*, because of 'kind-heartedness' by the official valuers (as for certain types of household goods) or because of outright evasion (particularly likely in the case of cash and valuables in the deceased's own possession). Moreover, as estate duties are assessed on the

estates of individuals, it is not possible to discover from them the distribution of capital between families. Thus a growing tendency for owners of large properties to distribute their assets amongst the members of their families well in advance of death will affect the shape of the distribution of capital *between persons*, even though the distribution *between families* has remained unchanged.

In spite of these defects, the estate duty returns remain our major source of information and the corner-stone of this analysis. The data from the savings surveys suffer from other defects, which make them even less reliable—on their own—for the purpose in hand. The principal difficulty with unofficial surveys is the impossibility of ensuring complete and accurate response. The 1954 savings survey achieved a response rate of only 67 per cent amongst the 'income units' approached for interviews; and there was almost certainly a substantial amount of understatement of assets even by those who were 'successfully' interviewed. In the outcome, the estimates of the total amount of personal capital which can be derived from this survey appear to represent only about two-thirds of the true amount. Nevertheless, the savings survey figures can be used to give some indication of the distribution of capital amongst persons with less than £2,000 of net capital; and this is the purpose for which they have been employed here.

Savings survey estimates for the population are arrived at by multiplying the average net worth per income unit in the sample by the estimated total number of income units in the population. Estimates from the estate duty returns cannot, of course, be obtained in this manner, as the persons who die in any given period are not a random sample of the population. The probability of death rises with age and differs between the sexes. But it is reasonable to assume that *within* each age-sex group death strikes more or less at random. Hence, if the estate duty returns are given for each age-sex group separately it is possible to 'blow-up' the sample by the reciprocal of the mortality rate within each group.¹ As a further refinement the mortality rates used in these calculations may be based on the mortality experience of persons in 'upper class' occupations only, on the assumption that persons with taxable estates belong predominantly to such classes. This adjustment was first made by Daniels and Campion [3] in their estimates for the years 1911-13 and 1924-30, and was continued by Campion in his estimates for 1932-34 and 1936 [4].

In this study we cover the years 1951-58, and the estate duty returns for each year have been inflated by reciprocals of the estimated specific (age-sex) mortality rates of persons in Social Classes I and II, as defined in the 1951 Census. The tables published by the Inland Revenue [8] show the number of estates on which duty was first paid in each financial year and the net capital on which duty was *actually* paid in that year, the estates being classified by ranges of net capital value, by country (England and Wales together until

¹ This method was first applied by Bernard Mallet (without distinguishing sex) to figures specially assembled by the Inland Revenue for the years 1905 and 1906[6].

TABLE I

Estimates of Aggregate Personal Capital from the Estate Returns for Great Britain

					<i>Persons with over £2,000 net capital</i>		<i>Aggregate net capital owned</i>
<i>Year</i>					<i>Number ('000)</i>	<i>Percentage of all persons 20 and over</i>	<i>(£ million)</i>
1951	...	...	...	...	2,920	8.4	30,310
1952	...	...	...	...	3,260	9.3	31,510
1953	...	...	...	...	2,890	8.3	27,540
1954	...	...	...	...	2,980	8.5	30,400
1955	...	...	...	...	3,080	8.8	29,620
1956	...	...	...	...	2,930	8.3	31,150
1957	...	...	...	...	3,470	9.8	33,750
1958	...	...	...	...	3,870	10.9	38,100
Average 1951-56	...	...	...	...	3,010	8.6	30,090

1957-58, and Scotland), by age (eight groups), and by sex. We have blown up the figures in each of these cells separately and aggregated the results to give estimates for Great Britain. As a rough approximation it can be assumed that the returns for each financial year relate to deaths occurring in the previous calendar year (e.g. returns for 1951-52 relate to 1951); but because the process of assessing estates for duty sometimes takes several years there are certain peculiarities in the figures, which mean that the estimates for a single year may not be entirely satisfactory. To overcome this difficulty we have averaged the results for the period 1951-56 to provide an estimate of the situation existing at the beginning of 1954, which happens also to be approximately the date of the 1954 survey. As will be seen, there was no obvious trend in aggregate capital values between 1951 and 1956, so that these years can conveniently be treated as a homogeneous group.

The estate duty returns form the basis of our estimates of the distribution of capital amongst those possessing over £2,000. For those below this level we have used a variety of sources and techniques, which include (1) extrapolation of cumulative frequency curves, (2) evidence gleaned from the 1954 savings survey about the relative holdings of particular assets by those above and below this level, and (3) information about total assets of persons (e.g. life funds) available from independent sources. A detailed description of how these calculations were made is given in the appendix.

THE RESULTS

Estimates from the Estate Duty Returns

When the estate duty returns are blown up by the methods outlined in the previous section, and aggregated, we obtain estimates of the total net capital of persons with net capital above the exemption limit in Great Britain (no figures are available for Northern Ireland). The exemption limit was £2,000 from 1951 to 1954 and £3,000 thereafter. For the year 1954-55 the returns show the number and value of estates falling between £2,000 and £3,000, from which estimates of the numbers and values in this range for the succeeding years have been made. The resulting figures are given in Table I.

TABLE II
Distribution of Persons with over £2,000 Net Capital, Great Britain

Net Capital					Average number 1951-56 ('000)	per cent	Range of percentages over the six years
£2,000— ...	...	...	...	...	1,788	59.4	58.5—61.2
£5,000— ...	...	...	...	...	639	21.2	19.6—22.6
£10,000— ...	...	...	...	...	398	13.2	12.4—14.0
£25,000— ...	...	...	...	...	121	4.0	3.5—4.4
£50,000— ...	...	...	...	...	44	1.5	1.2—1.6
£100,000— ...	...	...	...	...	16	0.5	0.4—0.6
£250,000— ...	...	...	...	...	4	0.1	0.1—0.2
TOTAL ...	...	...	...	...	3,010	100.0	—

With the exception of a rather surprising upward fluctuation in the numbers in 1952, followed by a downward fluctuation in the values in 1953, the figures for the years 1951-56 appear to relate to a very stable situation. In 1957 and 1958, however, there seems to have been an upward trend both in the numbers and in the values. It is difficult to isolate the reasons for this trend, since the big rise in equity prices began in 1954, and house prices also began rising about the same time. The explanation may be that there is a longer average time lag in assessment than we have assumed. In any case, however, it seems reasonable to take the years 1951-56 as a group and to assume that the average of these years is the best estimate available of the situation existing early in 1954.

Table II shows the average estimated number of persons in each range of net capital in 1951-56 and the same figures expressed as percentages of the total number of persons with over £2,000. As can be seen from the last column, the percentage of persons in each capital range fluctuated from year to year within the period. Chi-squared tests for each year (of the original estate duty figures) show significant differences from the average of the period in all the years (one at the five per cent level and the remainder at the one per cent level). This could be due to real fluctuations in the distribution of wealth (as opposed to those arising from sampling errors); it could also arise from changes in the time-lag between death and valuation.

The Overall Distribution of Capital

In order to estimate the distribution of capital amongst all persons it is necessary to make a decision about the scope of the population capable of owning capital. In most earlier studies [3, 4, 5] it was assumed that this population included only persons aged 25 and over; but we have thought it more realistic to lower this limit to 20 and over. Starting from the average figures for 1951-56 derived from the estate duty returns, (1) we have added estimates of the distribution of capital amongst persons with less than £2,000, (2) we have slightly rounded the distribution of persons above this level, and (3) we have increased somewhat the amount of capital estimated to be owned by them. Explanations of all this are given in the appendix. Table III gives our final estimates.

In broad outline these figures suggest that total personal net capital in early 1954 was about £40,000 million. Of this, nearly £31,000 million was owned by three million persons possessing over £2,000 each; and the remaining £9,000 million was owned by the other 32 million persons aged 20 and over. In the top capital group there are 20,000 persons with more than £100,000 each and an average holding of over £250,000; in the bottom group are 16 million persons with less than £100 each and an average holding of less than £50.

In compiling these figures no adjustment has been made for capital which escapes assessment. The most important deficiencies in this respect arise from the exemption of pension funds, property settled in trust on a spouse (which is exempt from assessment when the spouse dies) and property in the hands of discretionary trusts (which may avoid assessment for an almost indefinite period). Pension funds at the end of 1953 amounted to about £2,000 million; but no one knows how much property is held by trusts. It is believed that property avoiding duty because of settlement in 1954 was about 10 per cent of the amount of net capital actually assessed. If this is so, an addition of about £3,000 million should be made under this head; and, with a further allowance of perhaps £1,000 million for discretionary trusts, the amount of personal net capital in 1954 might be estimated at about £46,000 million. It would not be unreasonable to assume that the whole of the trust capital belonged to those with over £2000, and about half the pension funds, giving them altogether about £36,000 million out of £46,000 million, or approximately 78 per cent of the total.

Our estimates of total capital are substantially higher than those made by Kathleen Langley for 1951 [9] and, more recently, by E. Victor Morgan for 1954 [10]. Part of the difference is due to the large allowance made above (admittedly arbitrarily) for trusts. The difference from Miss Langley's figures is also due to her use of general mortality rates instead of 'upper class' mortality rates. Professor Morgan's estimate of aggregate personal net capital in 1954, including pension funds but excluding trusts, comes to less than £36,000 million, compared with our figure—on the same basis—of £42,000 million. It is not possible to discover the exact reasons for this very wide difference; but it seems that Professor Morgan has made much smaller allowance for the capital holdings of those with less than £2,000 than we have done, and a much larger allowance for liabilities. From such evidence as we have, from the savings surveys and other sources, we believe that we are nearer to the truth than he is.¹

The Components of Personal Capital

Total net capital owned by those above the exemption limit can be broken down into its major components with the help of a table published by

¹ Professor Morgan himself admits that his estimates are too low when compared with other data arising from his study [10, pp. 185-6].

TABLE III

Estimated Distribution of Personal Net Capital in Great Britain, early 1954

<i>Net capital (original ranges)</i>	<i>Number of persons aged 20 or over (‘000)</i>	<i>Amount of net capital (£million)</i>
Under £100	16,000	685
£100—	10,500	2,800
£500—	3,100	2,365
£1,000—	2,400	3,300
£2,000—	1,780	5,930
£5,000—	640	4,930
£10,000—	400	6,990
£25,000—	120	4,140
£50,000—	40	3,295
£100,000—	20	5,665
TOTAL	35,000	40,100

TABLE IV

Estimated Components of Total Personal Capital in Great Britain, early 1954

	<i>(£ million)</i>		
	<i>Held by persons with net capital of:</i>		
	<i>£2,000 and under</i>	<i>Over £2,000</i>	<i>Total</i>
Cash and bank deposits	2,900	4,600	7,500
Shares and deposits in building societies, co-operative societies, etc. and mortgages, bonds, bills, etc.	550	2,700	3,250
Government and municipal securities	1,500	6,000	7,500
Stocks and shares in companies	200	8,500	8,700
Land, buildings and trade assets	3,250	7,750	11,000
Household goods	500	700	1,200
Other property, income due, etc.	100	1,100	1,200
Life insurance funds	1,550	1,000	2,550
Total assets	10,550	32,350	42,900
Total liabilities	1,400	1,400	2,800
Total net capital	9,150	30,950	40,100
Number of persons aged 20 and over	32,000,000	3,000,000	35,000,000

the Inland Revenue [8] which gives the composition of assessed estates by ranges of value. It has to be assumed for the purpose of this calculation that the composition of capital (within any given range) is uniquely determined by its size, and not by the age or sex composition of its owners.¹ For each of these assets, and for total liabilities, we have made estimates of the amounts owned by those below the exemption limit, with the help of cumulative curves extrapolated downwards and of data from the savings survey and other sources. The results of these calculations—more fully described in the appendix—are given in Table IV. All the figures are heavily rounded so as to make it clear that little accuracy is claimed for them. Nevertheless, they may be useful as an outline of the broad picture. It must also be remembered that these figures—like those in Table III—exclude pension funds and trusts.

¹ Mr. J. R. S. Revell, of the Cambridge Department of Applied Economics, has recently arranged for tabulations of each asset by age, sex and total capital range, from which he will be able to check the validity of this assumption.

TABLE V
Concentration of Ownership of Various Assets, Great Britain 1954

	Percentages of total owned by:		
	Top 1%	Top 5%	Top 10%
Total personal net capital (excluding pension funds and trusts)	43	68	79
Cash and bank deposits	23	48	64
Government and municipal securities	42	71	83
Stocks and shares in companies	81	96	98
Land, buildings and trade assets	28	58	74
Net capital of person at lower limit	£15,000	£3,550	£1,700

Very roughly, it seems that about a quarter of total personal net capital is invested in land, buildings and trade assets, or, if we add household goods, about 30 per cent in physical assets. Of the remaining 70 per cent (approximately £28,000 million) one quarter consists of cash and bank deposits, one quarter of government and municipal securities, about 30 per cent is in stocks and shares, and the remainder is distributed over other assets.

Liquid assets owned by persons in 1954 consisted of £7,500 million of cash and bank deposits, about £2,000 million in building societies and co-operative societies, and £3,000 million in national savings securities, making about £12,500 million in all, or about 30 per cent of total net capital.

It will be seen that nearly all stocks and shares in companies are estimated to belong to those with net capital of over £2,000, as well as four-fifths of government and municipal securities. People with less than £2,000 keep most of their capital in cash, bank deposits (including savings banks), government securities (mostly national savings certificates), houses, and life insurance. In addition they probably have a large share in accumulated pension funds (perhaps as much as £1,000 million out of £2,000 million).

The Concentration of Ownership of Capital

Personal wealth, as we have said, is very unequally distributed in this country. From the data assembled for this study it is possible to estimate—by interpolation—the proportions of total net capital (excluding pension funds and trusts) owned by various strata of the population. Table V gives figures for the top one per cent, top 5 per cent and top 10 per cent respectively of the adult population of Great Britain.

These estimates suggest that in 1954 the top one per cent of British adults owned 43 per cent of total net capital and the top 10 per cent 79 per cent. This distribution is very much more unequal than the distribution of income—either before or after tax. In 1954 the top one per cent of incomes (married couples and single adults) received about 5½ per cent of ‘allocated’ income after tax, and, according to a rough estimate about 7 per cent of total income [1, p. 31]; and the top 10 per cent of incomes received about 25 per cent of allocated income after tax [1, p. 14]. Lorenz curves comparing the distribution of total net capital and of allocated income after tax are shown in

Fig. I.

Lorenz Curves of Post-tax Income
and Net Capital, 1954

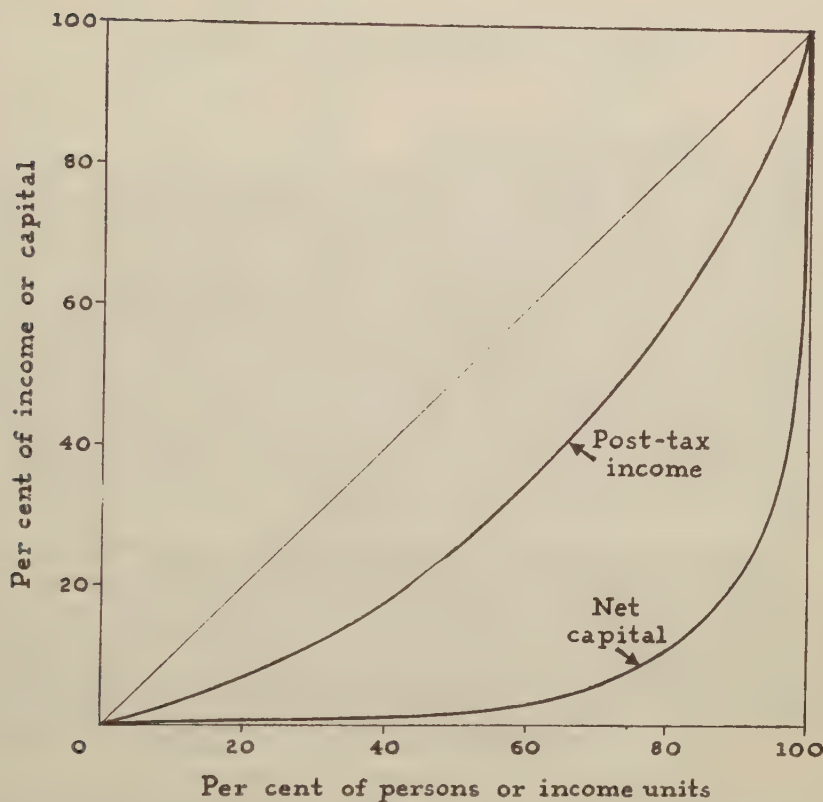


Fig. 1.¹ The Gini coefficients of concentration are 0.34 for Income and 0.87 for Capital (1.00 being the maximum concentration possible).

Amongst the different types of asset, some are highly concentrated in the hands of the top strata of capital owners and others less so. As can be seen from Table V, stocks and shares of companies are very highly concentrated, some 81 per cent being held by the top one per cent of persons and almost all by the top 10 per cent. Government and municipal securities are distributed very similarly to total capital; but cash and bank deposits, and land, buildings and trade assets, are somewhat more widely dispersed.

¹ These curves are not strictly comparable because they show the concentration of capital amongst *persons* aged 20 and over, and the concentration of income amongst *income units* (married couples and single persons with incomes above £50). But these differences in definition could not account for more than a very small part of the differences in degrees of concentration shown. Both sets of data have been cumulated from the lowest ranges upwards.

TABLE VI

Changes in the Percentages of Personal Net Capital Owned by Various Groups of the Population, 1911-1956

(England and Wales, persons aged 25 and over)

<i>Stratum of the Population</i>					1911-13	1924-30	1936	1951-56
Top 1 per cent	...	...	...	...	65.5	59.5	56.0	42.0
Top 5 per cent	...	...	...	...	86.0	82.5	81.0	67.5
Top 10 per cent	...	...	...	...	90.0	89.5	88.0	79.0
Top 20 per cent	...	...	...	...	—	96.0	94.0	89.0

Sources: 1911-13 and 1924-30 from Daniels and Campion [3].

1936 from Campion [4].

1951-56: see text.

Trends in the Concentration of Capital

Estimates of the distribution of capital amongst persons aged 25 and over in England and Wales were made by Daniels and Campion for 1911-13 and 1924-30 [3], and by Campion for 1936 [4]. In order to continue this series we have computed estimates for persons aged 25 and over in England and Wales in 1951-56. By interpolation on double-logarithmic cumulated curves of (a) numbers of persons and (b) amounts of net capital, we have estimated the proportions of total net capital owned by various strata of the population, starting from the top. These figures, given in Table VI, suggest that in the period from 1911-13 to 1936 there was a slow but persistent tendency towards less inequality. But in the final period—from 1936 to 1951-56—the distribution of capital appears to have altered much more radically.

In interpreting these figures we must again bear in mind, first, that they exclude pension funds and trusts; and secondly, that there has probably been an increasing tendency for large owners of property to distribute their property amongst their families well in advance of death.¹ This tendency has probably been reinforced by an increasing tendency to take advantage of the Married Woman's Property Act, under which the proceeds of insurance policies on the life of the husband which have been made over absolutely to the wife are treated as separate estates. The effect of all this will be to reduce the apparent concentration of capital in the hands of the top one per cent of owners. But very little such property is likely to find its way into the hands of persons below the top ten per cent of property owners, since the top ten per cent in 1951-56 included everyone with more than £1,700 of capital.

Thus it is almost certainly misleading to take account solely of the trend in the share of capital owned by the top one per cent of persons. If, however, we make the assumption that redistribution within families affects only the distribution within the top ten per cent of persons, but not beyond that range, it is possible to gauge the trend in the distribution of capital by measuring the share of total capital owned by the top ten per cent of persons. We

¹ In order to escape assessment in the donor's estate, gifts *inter vivos* must have been made at least five years before death. Redistribution of capital through gifts will not alter the estimate of total personal capital, unless donors succeed in choosing donees with an average expectation of life above that for their age and sex group.

can see from Table VI that this share declined only very slightly from 1911-13 to 1936; but from 1936 to 1951-56 it fell from 88 per cent to 79 per cent.

How far would these figures be altered if we could take into account the distribution of beneficial ownership of pension and trust funds? In our present state of ignorance it is impossible to give any reliable answer to this question. Campion [4] guessed—with the help of the Inland Revenue—that settled property escaping assessment in 1936 was of the order of 5 per cent of property assessed. In 1954, as we have said, it seems probable that this proportion may have risen to about 10 per cent. Pension funds in 1936 were very small, perhaps only £400 million, but most of this would be owned by the top 10 per cent of property owners. In 1954 pension funds amounted to about £2,000 million, of which, as we have suggested above, about half may have been owned by the top 10 per cent of owners. About discretionary trusts we know nothing. For the sake of example, however, let us assume that in 1936 the top 10 per cent of property owners in Great Britain owned £1,000 millions of settled property, £300 million of pension funds and £300 million of discretionary trust funds, while in 1954 they owned £3,000 million of settled property, £1,000 million of pension funds and £1,000 million of discretionary trust funds. (The remaining £100 million of pension funds in 1936 and £1,000 million in 1954 are assumed to belong to the bottom 90 per cent of property owners.) With this combination of assumptions the proportion of total capital owned by the top 10 per cent of property owners shows a decline from 88.5 per cent in 1936 to 79.5 per cent in 1954, which is virtually the same as the decline shown in Table VI)¹

We believe, therefore, that it is fairly safe to conclude that there has been *some* reduction in the inequality of wealth in the past twenty years. But the extent of this change should not be exaggerated; nor can it be known at all certainly unless the authorities are prepared to collect (and publish) much more information than exists at present about the capital owned by trusts and about the characteristics of their beneficiaries.

Comparison with the United States

In a recent study of the concentration of personal wealth in the United States [11] Robert J. Lampman has estimated that in 1954 the share of total personal net capital (excluding pension and trust funds) owned by the top one per cent of Americans aged 20 and over was about 24 per cent. If this is compared with our figure for Great Britain of 43 per cent (Table V) it is obvious that the concentration of personal wealth in this country is much greater than in the United States (see also [2]). In the 1920s the difference between the two countries in this respect was even more striking. Lampman estimates that 32 per cent of personal net capital was owned by the top one per cent of American adults in 1922, and 36 per cent in 1929. In England

¹ For the sake of this example the percentages given in Table VI have been applied to estimates of total capital in Great Britain in these years in order to estimate the amounts owned by the top 10 per cent in each year.

TABLE VII

Estimated Components of Personal Net Capital in Great Britain, 1936 and 1954

Components	Amount (£ million)		Per cent of total net capital	
	1936	1954	1936	1954
Cash and bank deposits	2,300	7,500	11.5	18.7
Building societies, etc.	1,900	3,250	9.5	8.1
Government and municipal securities	4,300	7,500	21.5	18.7
Stocks and shares in companies	6,450	8,700	32.3	21.7
Land, buildings and trade assets	4,250	11,000	21.2	27.4
Household goods	600	1,200	3.0	3.0
Other property, etc.	800	1,200	4.0	3.0
Life insurance funds	1,200	2,550	6.0	6.4
Total assets	21,800	42,900	109.0	107.0
Total liabilities	-1,800	-2,800	-9.0	-7.0
Total net capital	20,000	40,100	100.0	100.0

and Wales, according to Daniels and Campion's figures [3], the comparable figure for 1924-30 was at least 60 per cent (see Table VI).¹ It is probable that the concentration of personal wealth in Britain has always been greater than in America. In 1890, according to G. K. Holmes and C. B. Spahr (quoted in [11, p. 388]), the top one per cent of American families owned 51 per cent of total wealth; but Lampman believes that this must be an over-estimate.

Changes in the Composition of Personal Capital

In 1936 total personal net capital (excluding pension and trust funds) in Britain was estimated by Campion [4] to be about £20,000 million. This can be broken down, by similar methods to those used by us for 1954, into its major components. Rough estimates for the two years are set side by side in Table VII.

It is interesting to note, first, that over this period total personal capital approximately doubled, whereas personal disposable income increased nearly threefold and consumer prices increased nearly two and a half times. Thus the relative economic significance of accumulated capital declined. If, however, we include pension and trust funds in total personal capital, it is probable that it increased between 1936 and 1954 more than twofold—from about £21,000 million to about £46,000 million, or by about 120 per cent.

Within the total some assets have increased faster than others. Cash and bank deposits increased more than threefold and land, buildings and trade assets nearly as fast (the main influence in the latter case being the rate of increase in the value of buildings). Government and municipal securities almost doubled; but a great deal of this was caused by the expansion in holdings of national savings securities, which increased sixfold. Other British government securities rose much less rapidly, and personal holdings of municipal and foreign government securities—at market value—probably declined.

¹ The figures in Table VI relate to persons aged 25 and over. If they were adjusted to a population aged 20 and over they would be slightly higher.

TABLE VIII

Distribution of Assets Among Top 10 Per Cent and Bottom 90 Per Cent of Adults
(persons aged 20 and over in Great Britain)

Components	Per cent of total net capital owned by			
	Top 10 per cent		Bottom 90 per cent	
	1936	1954	1936	1954
Cash and bank deposits	9.1	15.0	28.4	33.3
Building societies, etc.	9.1	8.6	12.2	6.2
Government and municipal securities	23.0	19.4	11.2	16.0
Stocks and shares in companies	36.3	26.6	4.1	2.5
Land, buildings and trade assets	20.7	25.3	25.4	35.8
Life insurance funds	3.9	3.4	21.1	17.9
All other assets, net of liabilities	-2.1	1.7	-2.4	-11.7
Total Net Capital	100.0	100.0	100.0	100.0

Total personal holdings of stocks and shares in companies (including private companies) increased between 1936 and 1954 by only about a third. (In the past few years, however, the rise in equity values will have changed this picture rather substantially). Somewhat surprisingly, personal holdings of public company shares seem to have remained a fairly constant proportion (about half) of the total value of such securities quoted on the Stock Exchange.

As a result of the varying rates of increase of the different components of personal capital, the shares of total net capital represented by the different components have changed. Cash and bank deposits have increased their share substantially, as also land, buildings and trade assets. The share of company securities fell (up to 1954) quite sharply, and of government securities to a smaller extent. In general, there has been a shift in the proportions away from 'upper class' assets and towards 'popular' assets. This shift was partly the result of the overall redistribution of wealth, but it also occurred *within* wealth groups. As can be seen from Table VIII, broadly the same sort of shift in the composition of assets occurred amongst both the top 10 per cent of wealth owners and amongst the bottom 90 per cent.

Distribution of Wealth between Age Groups

It is a well-known fact that *average* wealth increases with age, so that a disproportionate share of total personal capital is owned by elderly people. To a large extent, of course, this is the consequence of a planned substitution of capital for earning power.

We have made some approximate estimates of the distribution of total capital (excluding pension and trust funds) between age groups, and these are summarised in Table IX. It will be seen that the proportion of persons owning over £2,000 of net capital shows a steady rise with age. Reflecting this, nearly half of total net capital is owned by persons aged 55 and over, who represent less than a third of the adult population. Average net capital per person rises from about £330 in the 20-24 age group to over £2,000 in the group aged 75 and over. But a very large number of old people have little or no capital. According to the 1954 savings survey nearly half the income units in which the head was aged 65 or over owned less than £50 of net worth (not counting household goods and personal effects).

TABLE IX

Estimated Distribution of Capital between Age Groups, Great Britain, 1954

<i>Age group</i>					<i>Per cent in group owning over £2,000</i>	<i>Per cent of total net capital owned by age group</i>	<i>Per cent of total popula- tion aged 20 and over in age group</i>	<i>Average net capital per person £</i>
20—	...	...	...	...	1.6	2.6	9.1	330
25—	...	...	...	...	3.5	11.9	20.3	670
35—	...	...	...	...	6.1	15.9	20.3	900
45—	...	...	...	...	9.7	21.7	19.7	1,260
55—	...	...	...	...	13.0	20.2	14.9	1,550
65—	...	...	...	...	16.1	16.9	10.4	1,860
75—	...	...	...	...	18.4	10.8	5.3	2,310
Total	...	...	...	...	8.6	100.0	100.0	1,140

Within age groups the greatest degree of concentration of wealth is amongst the youngest adults. Of those aged 20–24 less than 2 per cent have more than £2,000; and the dispersion amongst these is very wide. Average net capital held by those with more than £2,000 varies from nearly £16,000 per person for those aged 20–24 to less than £10,000 per person for those in the age groups 45–74. In the final age group (75 and over) it rises to about £11,000. Amongst those with over £100,000 the average for the under 45's in 1951–56 was as high as £450,000, compared with less than £250,000 for those above this age. Presumably, this difference is largely the result of deliberate redistribution of very large fortunes by older people in anticipation of death. It thus gives some indication of the influence of the estate duty tax structure on the shape of the apparent distribution of wealth.

SUMMARY AND CONCLUSIONS

The study of the distribution of wealth is important, first, because of the economic and social power which wealth confers (independently of income), and secondly, because of the influence which the distribution of wealth exerts on the supply of capital. In addition, there is a special reason for giving close attention to this problem in this country since the distribution of wealth in Britain is exceptionally unequal.

The data available for such a study are, however, very inadequate. For those with net capital of over £2,000 (who represent about 10 per cent of all adults) there is a good deal of information from the estate duty returns. Although these are deficient in several respects, they can be used, in conjunction with estimated 'upper class' mortality rates, to obtain rough estimates of the distribution of capital amongst persons owning more than £2,000. These estimates exclude property settled on spouses and capital owned by discretionary trusts and pension funds, as well as certain less important items. The values of some goods are also understated.

For the rest of the population the principal direct source is the savings surveys of 1953 and 1954, which attempted to obtain figures for total net

worth (with certain exceptions) from a representative sample of the non-institutional population. These figures are also not entirely reliable, because of a downward bias in response; but they have been used, together with other information, to arrive at rough estimates of the amounts of capital owed by persons below the estate duty exemption limit.

The estate duty returns suggest that in the years 1951-56 the total value of personal net capital remained fairly stable. In 1957 and 1958, however, there were distinct increases in the value of property held by those above the exemption limit. In order to smooth out errors in the annual figures, we have averaged the estimates of numbers of persons and of total capital above £2,000 for the years 1951-56 and treated these results as applying to the mid-point of the period, i.e. early 1954. This was also the date of the 1954 savings survey.

Our final estimates of the distribution of capital (excluding pension and trust funds) suggest that in early 1954 the total value of personal net capital in Great Britain was about £40,000 million. This is almost exactly double the amount estimated by Campion for 1936. If pension and trust funds were included, the total for 1954 might be of the order of £46,000 million, which would be more than twice the equivalent figure in 1936.

The concentration of ownership of capital is much greater than the concentration of income. Out of total real disposable income the top one per cent of income units received in 1954 only about 7 per cent; out of total personal net capital (excluding pension and trust funds) the top one per cent of persons aged 20 and over in 1954 owned 43 per cent.

Wealth is much more unequally distributed in Britain than in the United States. In 1954 the top one per cent of Americans aged 20 and over are estimated to have owned only about 24 per cent of total personal net capital.

Over the past twenty years there has been some reduction in the inequality of personal wealth in Britain. Capital owned by the top one per cent of persons aged 25 and over (in England and Wales) fell from 56 per cent of the total in 1936 to 42 per cent in 1951-56. Part of this fall, however, must be attributed to an increasing tendency to redistribute capital within families, in order to minimise death duties. But, since almost all of this redistribution is likely to take place within the top ten per cent of persons, the tendency towards less inequality can be shown by the decline in the share of the top ten per cent of persons, which fell from 88 per cent in 1936 to 79 per cent in 1951-56.

These changes in the distribution of wealth are reflected in changes in the composition of the total personal balance sheet. The proportions of liquid assets and physical property (especially owner-occupied houses) in the total have risen and the proportion of stocks and shares has declined (up to 1954). But similar changes have also occurred *within* similar layers of the population (in terms of their ranking by total capital).

Estimates of the distribution of capital between age groups confirm the well-known fact that average wealth increases with age. Within age groups

the greatest degree of concentration is amongst the youngest. Much of this, however, probably reflects a redistribution of capital between age groups designed to avoid death duties.

Although our figures give some indication of the distribution of wealth in Britain in the 1950s, the most striking thing about them is their extreme roughness. The fact is that existing sources of data on personal wealth are quite inadequate for a serious study of the problem. Different investigators arrive at different conclusions, even in some cases about the orders of magnitude of the figures; and none can be sure which, if any, are the more reliable figures. In view of the extreme inequality of wealth distribution in Britain, and of the economic and social effects of this inequality, it is time that steps were taken in this country to collect better and more comprehensive statistics about the ownership of personal capital.

APPENDIX

ESTIMATING METHODS EMPLOYED

1. *The Blow-Up of the Estate Duty Returns*

The estate duty data are taken from the annual *Reports of the Commissioners of Her Majesty's Inland Revenue* for the years ending March 31st, 1952 to 1959. For each year the Reports contain tables of numbers of estates first paying duty in that year and the amount of capital on which duty was actually paid, classified by country (England and Wales together, and Scotland), by age (eight significant groups and one for 'age not stated'), by sex, and by range of net capital value of estate (seven groups).

The data for each financial year can be assumed broadly to apply to the estates of persons dying in the preceding calendar year (i.e. it is assumed that there is an average time lag of three months in assessment); but some estates—especially the very largest—take several years to complete, and this causes some further difficulty. For example, in a period of rising values this extra time-lag is likely to produce an under-estimate of the value of estates falling in each year. Fortunately, in the period 1951–56 the total number and value of estates subject to duty remained relatively stable, so that we considered it not inappropriate to average the (blown-up) figures for these years and regard the results as applying to early 1954.

In order to blow up the Inland Revenue data it is necessary to estimate suitable mortality rates for each age-sex-country class. For this purpose we started with general mortality rates for each age-sex-country class derived from the *Annual Abstract of Statistics*. But owners of property above £2,000 are likely to have lower mortality rates than the general population. We assumed—following Daniels and Campion [3]—that their mortality rates would correspond more closely to the average rates for Social Classes I and II, as defined in the Population Census. These classes cover so-called 'pro-

fessional' and 'intermediate' occupations, married women being classified according to the occupation of their husbands. The total number of persons in these two classes in 1951 was almost twice as great as our estimate of the number of persons with estates above £2,000, so that mortality rates based on their experience may be over-estimates rather than under-estimates of the rates appropriate to persons with over £2,000 of capital.

'Social class' mortality rates can be calculated only for the years in which a Census is taken, and we have had to assume that the proportionate difference between general mortality rates and 'upper class' mortality rates remains constant during the years following each Census. Thus the procedure followed was to estimate 'upper class' mortality rates in 1951, to compare them with general mortality rates in the same year and to adjust the general mortality rates in subsequent years by the same proportions as were found to apply in 1951.

Social class mortality rates for England and Wales, based on the mean number of death registrations in the years 1949-53 and the Population Census for 1951, are given in [12]. Separate figures are given for males, for married women, and for single women. But before using these figures we were obliged to make certain adjustments. The first adjustment arises from the fact that some people fail to record their occupation (or previous occupation) in the Census schedule. Similarly, such data are sometimes (but less frequently) omitted from the death registrations. It was necessary to make some assumption about the social class distribution of such people and—for want of any better—we decided to distribute them proportionately over the social classes in the Census and in the death registrations respectively.

Secondly, there is a tendency for the death registrations to give a somewhat more rosy view of the social class distribution of the deceased than the Census. In a special matching study of Census schedules and death registration statements for 10,000 deaths registered 3 weeks after the 1951 Census the General Register Office found significant discrepancies, and—in the case of males—a distinct upward bias in the recording of social class in the death registers. On the basis of this sample it would appear that the 'upper class' mortality rates for males given in [12] are over-estimated by 8.3 per cent. We have, therefore, adjusted our estimates of 'upper class' mortality rates for males to this extent.

Since information about the social class of widowed and divorced females is very poor, our calculations of female social class mortality rates have been based solely on the relation between general mortality rates and 'upper class' mortality rates for married and single women combined.

For Scotland the distribution of males by social class—as recorded in the 1951 Census—is given in [13]; and the distribution of male deaths by social class—for the years 1949-53—is given in [14.] In each case, as for England and Wales, we distributed the 'unoccupied' proportionately amongst the social classes and, in the absence of a special matching study for Scotland, we assumed that there was the same net upward bias in recording the social

TABLE A

Estimated 'Upper Class' Mortality Rates as Percentages of General Mortality Rates in 1951

	Age groups						
	20- 24	25- 34	35- 44	45- 54	55- 64	65- 74	75 and over
<i>England and Wales</i>							
Males	96.4	75.5	74.2	80.6	83.7	87.5	91.8
Females	66.7	72.5	84.6	89.4	92.9	91.5	92.5
<i>Scotland</i>							
Males	87.9	76.6	81.2	80.3	85.8	95.4	95.6
Females	61.1	73.5	92.5	88.7	95.2	99.8	96.4

class of male deaths in Scotland as in England and Wales. In this manner we arrived at estimates of 'upper class' mortality rates for males in Scotland in 1951.

No information has been published about the social class distribution of female deaths in Scotland, so we were obliged to estimate the 'upper class' mortality rates of Scottish females in 1951 indirectly. We first assumed that the ratio of 'upper class' male and of 'upper class' female mortality rates would be the same in Scotland as in England and Wales. But when we performed the same calculation for general mortality rates we found that it resulted in under-estimates of the general mortality rates for females in Scotland. So we adjusted our provisional estimates of 'upper class' female mortality rates in Scotland by the ratio of the actual general mortality rates for females in Scotland to the 'calculated' general mortality rates. The resulting figures are obviously not very reliable; but such errors as they contain will have relatively little effect on the aggregate estimates of capital for Great Britain as a whole.

The outcome of all these calculations was a series of estimated ratios of 'upper class' mortality rates to general mortality rates in 1951. These are given in Table A.

It will be noted that the mortality rate of 'upper class' males aged 20-24 has a smaller proportionate deviation from the rest of the population than that of most of the higher male age groups. This may be because young 'upper class' males engage in various risky undertakings, including the driving of fast cars. It will also be noted that the Scottish figures show less consistency than those for England Wales, which suggests that they are of less reliability.

With the help of this table we proceeded to estimate 'upper class' mortality rates for each of the years 1951-58, by multiplying the general mortality rate for each age-sex-country class in each year by its corresponding 'correction factor', as given in the table. Next, we multiplied the figures published by the Inland Revenue of the numbers and values of estates paying duty by the reciprocals of these 'upper class' mortality rates, thus estimating the total numbers of persons owning capital above the exemption limit in Great Britain as a whole, and the amount of capital owned by them. For the

purpose of these calculations we assumed (1) that estates covered by the heading 'age not stated' in the Inland Revenue tables could be distributed proportionately (within estate ranges) amongst the reported age groups, (2) that the reciprocals of the mortality rates for persons aged 20-24 could be applied to estates of persons aged 'under 25', and (3) that estates of persons aged 75 and over could be combined in a single class (no information being available for distinguishing 'upper class' mortality rates for persons aged 85 and over).

The number of persons with net capital between £2,000 and £3,000, and the total net capital value of their holdings for the years after 1954 (when the exemption limit was raised to £3,000) had to be estimated on the basis of the proportions in that range in 1954, the only year for which such data were given.

2. *Estimates for the Whole Population*

The estimates of capital derived from the estate duty returns are deficient in several respects. In particular: (a) they exclude people owning net capital below £2,000 (b) they undervalue certain assets, e.g. owner-occupied houses, and (c) they fail to cover some assets at all, e.g. settlements on spouses (on the death of the spouse), pension and trust funds, and other minor exemptions.

It is not possible, with existing information to allocate the items covered by (c) above; nor even to do more than guess at the aggregate size of some of them. We have, therefore, limited ourselves to estimating the distribution of capital amongst those below the exemption limit and to making certain adjustments to the estimates for those above that limit to take account of some of the undervaluation.

The first step in estimating the capital ownership of those owning less than £2,000 was to cumulate the frequency distribution of persons in the seven ranges of value above this level. These figures were plotted on a double-logarithmic scale against the net capital values exceeded by each group, and a smooth curve was drawn through the points. This curve was then extrapolated so as to pass through the point corresponding to 35 million persons exceeding £10 (it being assumed that all persons aged 20 and over owned at least £10). From this curve we derived estimates of the number of persons in various class intervals below £2,000. These intervals correspond to those used for analysing net worth in the savings surveys, and the mean values of net worth within these classes in the 1954 survey were assumed to be appropriate to the distribution of persons just obtained. By multiplying out the frequency by the mean of each class we then obtained estimates of the aggregate capital owned by each class below £2,000. The total arrived at in this way was £8,470 million which, when added to the estimated £30,090 million for those over £2,000 gave a figure for the whole population of £38,560 million.

The next step was to check this calculation by carrying out a similar type of analysis for each main class of asset. For this purpose the capital owned

by each group above £2,000 was first divided into its components in the manner described in the text. Each of these components was then cumulated, and double-logarithmic curves were drawn showing the amount of each asset held by persons above each given level of total net capital.

In order to extrapolate these curves it was necessary to make an estimate of the total amount of each asset held by the whole adult population. In most cases such estimates were made by referring to savings survey data. But a difficulty arises because the savings surveys relate to 'income units', not to persons. Income units contain on the average about $1\frac{1}{2}$ persons aged 20 and over, so that one might expect them to hold on the average $1\frac{1}{2}$ times as much capital as individual persons. But the 1954 savings survey estimates of net worth are biased downwards by about one-third. Consequently, as a very rough approximation, it was assumed that the division of the income unit population at the £2,000 level of net worth corresponded to the division of the individual population at the same level of net capital. On this basis we used the proportionate division of each asset in the 1954 savings survey between income units above and below £2,000 of net worth as a rough guide to the division of that asset between individuals above and below £2,000 of net capital.

This rule was not followed universally. In the case of bank deposits, for example, it seemed probable that there was more downward bias amongst income units above £2,000 of net worth than amongst those below that level; and an adjustment was made accordingly.

Special difficulties arose with two types of asset, namely house property and life insurance funds. Under an administrative concession, which was in force until 1958, the Inland Revenue valued owner-occupied houses at less than their market value (with vacant possession) in those cases where 'a near relative of the deceased, who was ordinarily resident with him, remained in the house and had no other place of residence available'. Such houses were valued at their pre-war value plus any increase in the value when sold *without* vacant possession. The importance of this concession in monetary terms is unknown; but it may have resulted in an undervaluation of owner-occupied houses in 1951 of about 25 per cent, gradually falling away over the next seven years. For 1954 we have assumed that the item 'house property and business premises' should be raised by about 10 per cent. Even when this is done, a comparison with the 1954 savings survey shows aggregate property values substantially larger than this. It is possible that the savings surveys tend to over-estimate property values; but it is also possible that an even larger adjustment should be made to the Inland Revenue's figures.

The valuation of life insurances presents some curious problems. In principle, it might be expected that a blown-up sample of estates would yield an estimate for life insurance of the aggregate value of 'sums assured' by persons with capital above the exemption limit. According to published data the aggregate of sums assured early in 1954 was nearly £8,000 million. But the estimate from the estate duty returns of the value of life insurance

policies held by persons with more than £2,000 of net capital in 1954 amounts to less than £900 million. It is impossible to believe that this is a correct measure of the total of sums assured by this group; and it seems that, for some reason, the value of life insurance policies recorded in the estate duty returns is understated.

One possible explanation of this phenomenon is that many life insurance policies are associated with mortgages on owner-occupied property (and with other loans to persons). When the owner of such a policy dies the policy matures and is used immediately to extinguish the debt. Only the balance of the value of the policy over the debt would thus be paid to the executors and only this sum would appear in the assets of the estate. In so far as this system operates, the value of both insurance policies and of liabilities would be undervalued in the estate returns. But it seems improbable that this feature accounts for the whole deficiency in the life insurance figures.

In view of these considerations it became necessary to make completely new estimates of the distribution of life insurance funds between capital ranges. Although these estimates are based on very inadequate material, they at least aim to distribute the life *fund*, which is what is required. We started with the savings survey estimates of life insurance *premiums* paid by different net worth groups of income units. We assumed that premiums paid by income units with less than £400 of net worth were in respect of 'industrial' assurances and the remainder in respect of 'ordinary' life assurances. We then assumed that, on the average, the ratio of premiums to accumulated funds would be constant within each of these groups. So the estimate of the aggregate premiums paid by each of these groups was multiplied by an appropriate factor so as to arrive at a total life fund (excluding pension schemes) of £2,550 million. Of this, about £1,000 million was found to be attributable to those with net worth of £2,000 and over. This sum was distributed—very arbitrarily—amongst the various ranges above this level in proportion to the amounts of life insurance estimated for these ranges from the estate returns. The remainder was distributed amongst persons below £2,000 by extrapolation of the over £2,000 figures so as to arrive at the correct total.

When all these extrapolations and adjustments had been made—for each main asset and for total liabilities separately—the amounts estimated for each range of net capital were added up and compared with the estimates obtained by the original (global) extrapolation of the estate duty data. It was found that total net capital had been increased by about £1,500 million (to £40,100 million). Most of this addition was due to the upward valuation of house property; a smaller amount came from the adjustment to the life insurance figures; and the rest was the result of estimating the distribution of each asset separately. We cannot say how reliable these final estimates are; we can only say that we have studied them in detail and from every angle, and that they represent the best that can be done with the existing—very limited—amount of information available.

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